



THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL
INSPECTORS



THE NATIONAL BOARD & ASME
GUIDE

ASME
BPV CODE

**THE
NATIONAL
BOARD**

**“R” AND “NR”
AUTHORIZATION**

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STATEMENT OF POLICY ON THE USE OF THE ASME SINGLE CERTIFICATION MARK AND CODE AUTHORIZATION IN ADVERTISING

ASME has established procedures to authorize qualified organizations to perform various activities in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. It is the aim of the Society to provide recognition of organizations so authorized. An organization holding authorization to perform various activities in accordance with the requirements of the Code may state this capability in its advertising literature.

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Based on these objectives, the following policy has been established on the usage in advertising of facsimiles of the Certification Mark, Certificates of Authorization, and reference to Code construction. The American Society of Mechanical Engineers does not “approve,” “certify,” “rate,” or “endorse” any item, construction, or activity and there shall be no statements or implications that might so indicate. An organization holding the ASME Single Certification Mark and/or a Certificate of Authorization may state in advertising literature that items, constructions, or activities “are built (produced or performed) or activities conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code,” or “meet the requirements of the ASME Boiler and Pressure Vessel Code.” An ASME corporate logo shall not be used by any organization other than ASME.

The ASME Single Certification Mark shall be used only for stamping and nameplates as specifically provided in the Code. However, facsimiles may be used for the purpose of fostering the use of such construction. Such usage may be by an association or a society, or by a holder of the ASME Single Certification Mark who may also use the facsimile in advertising to show that clearly specified items will carry the Certification Mark. General usage is permitted only when all a manufacturer’s items are constructed under the rules.

STATEMENT OF POLICY ON THE USE OF ASME MARKING TO IDENTIFY MANUFACTURED ITEMS

The ASME Boiler and Pressure Vessel Code provides rules for the construction of boilers, pressure vessels, and nuclear components. This includes requirements for materials, design, fabrication, examination, inspection, and stamping. Items constructed in accordance with all the applicable rules of the Code are identified with the ASME Single Certification Mark described in the governing Section of the Code.

Markings such as “ASME,” “ASME Standard,” or any other marking including “ASME” or the ASME Single Certification Mark shall not be used on any item that is not constructed in accordance with all the applicable requirements of the Code.

Items shall not be described on ASME Data Report Forms nor on similar forms referring to ASME that tend to imply that all Code requirements have been met when, in fact, they have not been. Data Report Forms covering items not fully complying with ASME requirements should not refer to ASME or they should clearly identify all exceptions to the ASME requirements.

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Foreword

The American Society of Mechanical Engineers (ASME) is an organization whose mission is to protect the welfare and safety of the public. ASME is a not-for-profit organization comprised of volunteers from all sectors of the pressure equipment industry. These volunteers are responsible for the development and maintenance of the *ASME Boiler and Pressure Vessel Code* and implementation of a conformity assessment program for the construction of pressure equipment.

The National Board of Boiler and Pressure Vessel Inspectors (National Board) is a not-for-profit organization comprised of Chief Inspectors for the states, cities, and territories of the United States and provinces and territories of Canada. It is organized for the purpose of promoting greater safety to life and property by securing concerted action and maintaining uniformity in construction and post-construction activities of pressure-retaining items, thereby ensuring acceptance and interchangeability among Jurisdictional Authorities responsible for the administration and enforcement of various codes and standards.

This document describes the process for the issuance of the ASME *Certificate of Authorization* granting the use of the ASME Certification Mark issued by the American Society of Mechanical Engineers, and *Certificate of Authorization* granting the use of the Repair stamps (“R” or “NR”) issued by The National Board of Boiler and Pressure Vessel Inspectors.

This Guide was developed primarily for use by organizations making application under an ASME or National Board certification or accreditation program, ASME staff, National Board staff, and individuals participating on Teams performing Reviews or audits of an Applicant’s Quality Management System (QMS). This Guide may also be found useful for National Board Commissioned Inspectors and industry personnel associated with ASME Code construction and/or NBIC repairs and alterations, as required by:

ASME Boiler and Pressure Vessel Code *Certificate of Authorization* Program

The American Society of Mechanical Engineers offers *Certificates of Authorization* for the construction of new pressure-retaining equipment to various sections of the *ASME Boiler and Pressure Vessel Code* – Section I; IV; VIII, Divisions 1, 2, & 3; X; and XII. An application for a *Certificate of Authorization* must be completed through ASME CA Connect, an online application made available visiting the following website: <https://caconnect.asme.org/>.

The National Board “R” Stamp *Certificate of Authorization* Program

The National Board offers the *Certificate of Authorization* and the “R” symbol stamp for the repair and/or alteration of boilers, pressure vessels, and other pressure-retaining items. Requirements are described in [NB-415, Accreditation of “R” Repair Organizations](#).

The National Board “NR” Stamp *Certificate of Authorization* Program

The National Board offers the *Certificate of Authorization* and “NR” symbol stamp for the repair and replacement activities for nuclear items. Requirements are described in [NB-417, Accreditation of “NR” Repair Organizations](#).

Introduction

- (a) The purpose of *The National Board & ASME Guide* for reviews (Guide) is to provide consistency in all Reviews, including remote video conference reviews, conducted by or on behalf of The National Board of Boiler and Pressure Vessel Inspectors (National Board) and The American Society of Mechanical Engineers (ASME). This applies to all ASME Designees (Team Leaders) and National Board NB-290 Team Leaders. The Guide provides a ready reference to the *ASME Boiler and Pressure Vessel Code* (BPV Code), the *National Board Inspection Code* (NBIC), and applicable ASME and National Board procedures.
- (b) The contents of this Guide apply to both new applications and renewals of *Certificates of Authorization* and is based on:
- ASME – The requirements of the ASME BPV Code Sections I; IV; V; VIII, Divisions 1, 2, and 3; IX; X; XII and XIII; and the Conformity Assessment Requirements (CA-1) Standard; ASME Conformity Assessment Procedures, including but not limited to Conduct of Conformity Assessment Activities.
 - National Board – The NBIC and National Board procedures, including, but not limited to, NB-415, *Accreditation of “R” Repair Organizations*, and NB-417, *Accreditation of “NR” Repair Organizations*.
- (c) It is a requirement of the ASME and National Board codes and procedures that a demonstration or implementation of the Quality Management System (QMS) during the Review include the administrative functions to support the Quality Management System and the manufacturing, fabrication, repair, and testing necessary to demonstrate knowledge and ability to produce, repair, or alter items covered by the scope of the Applicant’s program. The demonstration will be conducted on work in- process whenever possible, or a mock-up, or combination thereof to the latest ASME Code and/or NBIC Edition as appropriate. The demonstration shall include the administrative, quality, construction, and repair/alteration functions for the items and orders being processed to meet the applicable Code requirements.
- (d) The intent of the format as presented in this Guide is to have the various sections and subsections follow the normal sequence of events during a Review. To achieve this sequence, manual review items have been separated from those relevant to implementation.
- (e) Compliance with applicable ASME and National Board codes and procedures is mandatory. In the event of a conflict, the applicable ASME and National Board codes and procedures shall take precedence over this Guide. This Guide is, as the name implies, for guidance only; but specific areas must be included in the written description of the Quality Management System as a minimum. Those areas designated as mandatory in this Guide are those designated as such by the various requirements and applicable ASME and National Board codes and procedures.
- (f) Boilers or pressure vessels manufactured for use in the United States or Canada must comply with the jurisdictional boiler and pressure vessel laws of the state or province where the vessel will be installed. The National Board procedure NB-264, *Criteria for Registration* has provisions that must be complied with to register boilers, pressure vessels, and parts with the National Board. Most Jurisdictions within North America require National Board registration of ASME-stamped items. It is highly recommended that all vessels that will be installed in North America be registered with the National Board.
- (g) Repairs and alterations to boilers and pressure vessels installed in the United States or Canada must comply with the jurisdictional boiler and pressure vessel laws where the vessel will be installed. The NBIC has specific requirements for registering repair forms with the National Board. Many Jurisdictions have additional requirements for registering repairs and alteration forms for vessels installed within their Jurisdiction. It is highly recommended that all repair forms for vessels repaired or altered in accordance with the NBIC be registered with the National Board if the vessel was originally registered, thus maintaining a record of all work performed on the vessel.

1.0 Elements of a Review

1.1 Format

- (a) All Reviews, whether for new issuance or renewal of National Board or ASME Certificate(s), are conducted in accordance with the ASME [Procedures Conduct of Conformity Assessment Activities \(The Conduct Document\)](#). Applicants will be advised of the Team size. Typically, a Review Team will consist of a Team Leader, as a minimum, and a representative(s) of the accredited inspection agency, when applicable.

While conducting a Review, the Review Team needs to be aware of special situations that may occur relating to ASME Conformity Assessment Policies, which are addressed in Appendix C.

- (b) ASME and the National Board mandate that the sequence of events identified below be performed by all Teams.
 - (1) Manual Review – The purpose of this Manual Review is to determine whether sufficient written controls for the Quality Management System have been provided to address all requirements of the Code for the scope of work being requested. An Applicant is required to provide a written description of how quality is to be achieved and verified in a manual. The manual is to describe the methods used to control how, when, where, and by who processes are to be initiated and completed to achieve the quality requirements required by the Code for the scope of work being requested. The written controls must be presented in a manner which renders the manual to be an auditable document.

The manual provided to the Team for review shall have been approved and implemented by the Applicant. Manuals which are required to be accepted by an Authorized Inspection Agency (AIA), are to be accepted by the Authorized Inspector (AI) prior to the start of the Manual Review. The Quality Checklist Guide identified in the announcement letter (announcing the Team size, dates of the on-site assessment, and request to make reservations) is to be completed and provided to the Team. Sufficient copies of the manual and [Quality Checklist Guide](#) are to be provided to the Team on the day of the Manual Review.

The Manual Review is performed on the first day of the Review and normally conducted at a location other than the Applicant's facility.

- (2) Entrance Meeting - This meeting is typically conducted on the second day of the Review at the Applicant's facility. During this meeting the Team Leader will:
 - (a) encourage participation of executive/senior management at the meeting;
 - (b) carry out introductions;
 - (c) verify Applicant's receipt and understanding of the [Due Process and Confidentiality](#) notice, and respond to any questions from the Applicant. If the Applicant does not have a copy of the notice, the Team Leader will supply a copy;
 - (d) review the company's application. If changes to the application are required, the Team Leader shall submit a revised application with the review report;
 - (e) discuss and agree upon the scope of work being requested;

- (f) describe the manner in which the on-site evaluation will be conducted, including notification of any potential findings so that the Applicant can implement any appropriate corrective actions prior to the conclusion of the Review;
 - (g) discuss the results of the Team's review of the manual and the changes considered significant for senior management response;
 - (h) request information on safety requirements and proprietary aspects so that the Team can comply in all respects;
 - (i) when appropriate, make Team assignments for the implementation portion of the on-site evaluation; and
 - (j) request a brief tour of the facilities for familiarization by the Team. An initial shop tour should provide the Team a first-hand view of the types of products in the facility, and where the implementation of Code activities will occur.
- (3) Implementation Demonstration – During the “Implementation Demonstration,” the Team will determine:
- (a) if those responsible for specific tasks are familiar with such responsibilities and perform them as described in the manual;
 - (b) if the manual described a system that covers all applicable Code activities appropriate for the requested scope of work to be performed; and
 - (c) if the system is being implemented as described in the shop and/or at the field site.

During this event, the Applicant will present the changes to the manual to the individual identified in the QMS who is responsible for accepting the manual or initiating changes based upon the Team’s review of the manual during the Manual Review. The Applicant should be strongly encouraged to complete any changes to the manual before the Exit Meeting. The Team can only recommend issuance or renewal of the Certificate(s) of Authorization when there is an accepted manual.

The purpose of the Implementation Demonstration is to evaluate the Applicant’s Quality Management System and its implementation. The Applicant must demonstrate all elements of its program to the current Code rules and show that they have the knowledge and capability to produce the Code items for the scope of work being requested on the Certificate. It is required that the implementation of the program be on actual Code work. If actual Code work is not currently being performed or does not demonstrate all aspects of the QMS, it is permissible for the program to be demonstrated using a mock-up, or a combination of Code work and mock-ups. Mock-ups are prohibited from being used to demonstrate an entire program when there is actual current Code work ongoing at the time of the Team’s visit.

Demonstration Item¹: An Applicant² requesting a single *Certificate of Authorization*

¹ The demonstration item shall be based on the latest Code Edition in effect at the time of the Review.

² This does not apply to an Engineering Contractor under Section I. For an Engineering Contractor Organization under Section I, without a fabricating facility, or a National Board Applicant with the requested scope of “Design Only”, a physical power boiler or part thereof is not required. However, a design specification must be provided, as well as additional administrative functions to demonstrate compliance with the organization’s QMS.

(e.g., “A”, “S”, “PP”, “PRT”, etc.) must demonstrate on an item that will be fabricated for the requested Certification Designator and scope of *Certificate of Authorization*. The demonstration must be an implementation of ALL aspects of the Quality Management System and is to include a performance of actual welding if welding is included in the scope of Code activities. If computer calculations are to be used, the Applicant shall demonstrate that the computer program has the capability of producing acceptable calculations.

For Applicants requesting multiple *Certificates of Authorization*, it is not necessary to have a demonstration item with design calculations for each Certification Designator. A demonstration item fabricated to any one of the requested Certificates may be used as the demonstration item for the implementation portion of the Review. The Applicant is advised to select a demonstration item based on type of Code item normally and most frequently manufactured. However, please note that if the demonstration item selected does not cover all aspects of the requested *Certificates of Authorization*, the Applicant will be required to demonstrate to some extent, (i.e., heat treatment and/or NDE procedures or services, previous job files, etc.), all Code requirements applicable to all requested scopes of the Certificates applied for to the Review Team.

For example, an Applicant applying for certification designators “U” and “U2” may decide to select a pressure vessel constructed to Section VIII, Division 1, as its only demonstration item for the Review. However, Section VIII, Division 2, requires additional design documentation which is not addressed under Section VIII, Division 1. As such, the Applicant will also be required to prepare and present to the Review Team design documents for Section VIII, Division 2, such as Examination and Inspection Plan, Manufacturer’s Design Report with supporting User Design Specification, and Certification of the design documents by an Engineer, as applicable.

For guidance in the selection of the demonstration item recommended/required based on Certification Designator requested, refer to the ASME [Quality Checklist Guide](#).

- (4) Team Closed Meeting – At the conclusion of implementation, the Team will hold a closed meeting to discuss the results of the Review and determine the Team’s recommendation to ASME and/or the National Board.
- (5) Exit Meeting – An exit meeting shall be held with the Applicant at the conclusion of the Review. Executive/senior management are encouraged to attend the exit meeting. The Team Leader will present the results of the Review, including any Quality System Manual and/or implementation deficiencies that were observed during the Review, resolution of the deficiencies, and the Team's recommendation to ASME and/or the National Board, who shall make the final decision on the related Certificate actions. The Applicant is encouraged to ask any questions pertinent to the Review and indicate any concerns or disagreements they have with either the reported findings observed during the Review or the Team's recommendation.

The Applicant should be reminded of [Due Process and Confidentiality](#) and their right to submit a written statement to ASME and/or the National Board, as appropriate, if they disagree with the findings, Team recommendations, or general conduct of the Review. Should the Applicant decide to submit a written statement and/or an AIA representative decide to submit a Minority Report, the aggrieved party(ies) must follow the ASME Procedures [Conduct of Conformity Assessment Activities](#).

For ASME reviews the Team Leader will present the Applicant a written copy of the findings along with the team’s recommendation. For National Board “R” reviews the

Team Leader will present the Applicant a copy of the report upon request.

2.0 Elements of the Quality System Manual

- (a) The Applicant's written QMS shall identify the elements, as specified in the applicable ASME appendices of Sections I; IV; VIII, Divisions 1, 2, and 3; X; and XII, and/or the NBIC as applicable. The sequence of the Quality System Manual elements is not mandatory. They may be in any sequence that suits the Applicant's system, but all mandatory sections or headings must be covered. If the Applicant does not include specific activities within their scope, they must state those specific activities are excluded from the scope of their program, i.e., for Section VIII, Division 1, and Section XII, due to the differing types of products, many Certificate Holders fabricating vessels are not required to perform stress-relieving heat treatment of completed vessels or parts. If this is the case, a statement in the Quality System Manual, such as the following could suffice for Section VIII, Division 1 and Section XII vessels only:

“Due to material type and limitations on thickness of materials used in Code fabrication, no heat treatment is required or used. If required in the future, this section will be revised to include the proper controls.”

- (b) Depending upon the items produced or work performed, some or all the following functions of an Applicant's Quality Management System must be explained to ensure that the controls needed to meet Code requirements are provided, and explain by title, who within the organization is responsible. The system the Applicant uses to meet Code requirements must be one suitable for their own circumstances. The Quality System Manual shall clearly indicate the scope and detail of Code activities the organization is capable of and intends to carry out.

The Quality System Manual must establish how the Applicant intends to satisfy all applicable Code requirements and defines who in the organization is responsible for initiating and monitoring these controls and requirements, and how they are documented.

- (c) The following outline is intended as a Guide for complying with the requirements for obtaining *Certificates of Authorization* in accordance with the NBIC and/or ASME Sections I; IV; VIII; Divisions 1, 2, and 3; Section X, Section XII and Section XIII.
- (d) A company which intends to perform Code activities on boilers or pressure vessels must establish in their written description or Quality Management System the controls necessary to satisfy the applicable Quality System Manual elements, as required by the applicable Code.
- (e) Controls shall be described within the QMS for Code activities at both shop and field sites as appropriate for the requested scope of the *Certificate(s) of Authorization*.
- (f) An English language version of the manual is mandatory for use by the Review Team, the Inspector, and Inspector Supervisor. If the manual in use is in a language other than English, a statement must be provided including the provision that, in the case of a conflict, the English language version shall prevail.

2.1 Facing Page

The Facing Page shall contain the legal company name, physical address, and the types of *Certificate(s) of Authorization* being applied for. It may also contain a description of Code activities to be performed, date of manual, mailing address, phone number, or other information desired by the Certificate Holder.

2.2 Scope

The scope is used to describe in detail the Code activities for each of the *Certificates of*

Authorization applied for. The manual shall clearly indicate the scope and type of Code work the organization is capable of and intends to carry out.

2.3 Statement of Authority

The *Statement of Authority* shall contain a statement referencing the Code section(s) to which the Quality System Manual is intended to comply. It must include authority and responsibility of those persons accountable for controlling and implementing the Quality Management System as described. Also, this section shall establish the individual's freedom in the organization to identify quality control problems, and to initiate, recommend, and provide solutions without compromising the requirements of the Code. It must also contain a statement of the full support of management. The *Statement of Authority* must be signed and dated by an officer of the company.

- (a) If the Quality System Manual for the "R" *Certificate of Authorization* is part of the ASME Quality System Manual, there shall be provisions for all applicable Codes to be identified in the appropriate *Statement of Authority and Responsibility*.
- (b) This section shall also contain a statement in the *Statement of Authority and Responsibility* that all repairs or alterations will be carried out in accordance with the requirements of the NBIC and jurisdictional requirements, as applicable.

2.3.1 Additional Requirements for Section X, Fiber-Reinforced Plastic Pressure Vessels

The *Statement of Authority* shall contain a statement referencing the applicable Class or Classes of the Section X vessel to be fabricated.

2.4 Manual Control

- (a) Manual control responsibilities that must be addressed are:
 - (1) preparation, revision, distribution, and implementation of the Quality System Manual and controls of same (which include exhibits or sample forms);
 - (2) referencing how the Quality System Manual will be revised, either by page, paragraph, or section, and how these revisions will be identified, i.e., delta sign, vertical line, and/or revision level;
 - (3) reference of proposed revisions to the Quality System Manual to the Inspector for acceptance prior to inclusion and/or implementation;
 - (4) the provision of a current copy of the Quality System Manual for use by the Inspector;
 - (5) custody and control of the Certification Mark and/or "R" or "NR" Code symbol stamps and their use;
 - (6) responsibility for performance and documentation of required inspections, examinations and tests, acceptance of production functions by signing or initialing, and dating the traveler, process sheet, or checklist;
 - (7) liaison with the Inspector, including notification of work progress and approaching inspection points or hold points designated by the Inspector;
 - (8) other responsibilities assigned by management under the Quality System Manual, such as calibration of measuring and test equipment, receiving inspections,

- (9) resolution of nonconformances, certification of ASME *Manufacturer's Data Reports*, certification of appropriate National Board Form "R" Reports (R-1, R-2, etc.), etc.

2.5 Electronic Quality Management Systems

- (a) When the Applicant is utilizing an electronic Quality Management System, the following controls must be addressed, and the system must be capable of being audited.
 - (1) Does the electronic Quality Management System ensure that provisions are included for approvals, acceptance, issuance, distribution, and revisions of documents?
 - (2) Who is authorized to access the system?
 - (3) How are changes made?
 - (4) How is the user of the system notified of revisions?
 - (5) How are approvals and acceptance identified?
 - (6) Are there controls for new documents and revisions to be reviewed and accepted by the Inspector?
 - (7) Is a printed copy of the document necessary? Or is file access limited to 'read only'?
 - (8) When printed copies of any document in the file are necessary; are controls in place to ensure that invalid and/or obsolete documents are promptly removed from all points of issue or use? Printed copies may be used when the system is audited by outside organizations, such as ASME, National Board, or AIA's.
 - (9) Will the Quality Management System be used only on the company's network, on a CD-ROM, or on a local personal computer?
 - (10) Who is authorized to develop, revise, distribute and notify individuals of any document changes?
 - (11) Does the system establish either a PIN number and/or electronic signature of individuals authorized to approve and accept the contents of the electronic Quality Management System?
 - (12) Does the system include controls for acknowledgment by authorized individuals that files have been received? This could be as simple as an email program.
 - (13) Companies that introduce an electronic Quality Management System normally provide orientation to their employees. The Inspector should receive the same orientation as the employees and have necessary access to the system to perform their required duties.
 - (14) Note that for all Reviews, a printed copy must be furnished to each Review/Team Member.
- (b) For programs that utilize CDs, the system must describe how the CDs are to be generated,

- (c) distributed, and controlled. Some features should include:
- (1) Who is responsible for control of all CDs?
 - (2) What distribution system is used to assign documents to individuals?
 - (3) If downloaded, how are CDs protected to prevent changes by the user? This could be programmed on the disk as 'read-only'.
 - (4) When revisions are required, what system is in place for the distribution of the replacement CD, as well as for the retrieval of previous Editions of the CD?
 - (5) What controls are in place for a printed copy of any document in the file, to ensure that invalid and/or obsolete documents are promptly removed from all points of issue or use?

2.6 Organizational Chart(s)

- (a) This should be, as the name implies, an organizational chart, not a functional chart. It should contain job titles of key personnel, such as plant manager, manager of engineering, etc., as used throughout the manual to designate responsibilities within the actual organization. Functional responsibilities, such as Nondestructive Examination (NDE), receiving inspection, welding material issue, etc., may be shown under job titles.
- (b) The chart shall contain, as a minimum, those key job titles controlling engineering, purchasing, manufacturing, field activities (if used), and quality control functions, showing the relationship to management. In large and complex organizations, additional departmental charts are often desirable, showing lower-tier job titles which are referred to in the manual and to whom Code responsibilities are specifically assigned.
- (c) Job titles used in the text of the manual must be consistent with those shown on the organizational chart.

2.7 Drawings, Design, Calculations, and Specifications

The following items include responsibilities that should be addressed by Manufacturers/installers that perform work to any of the *ASME Boiler and Pressure Vessel Code* sections. Depending upon products or work performed under the Code, some of the following may be of more importance than others in the Manufacturer's/installer's system.

- (a) Who and what document is used to review the customer's specification to ensure fabrication of the class of vessel being constructed is within the scope of the issued *Certificate of Authorization*?
- (b) Who prepares and approves design calculations and drawings?
- (c) Subcontract activities:
 - (1) Who is responsible for the review of customer's supplied calculations, specifications, and drawings, to ensure that Code compliance can be attained prior to release to fabrication?
 - (2) If supplied by the customer or other qualified source, how are design calculations and drawings reviewed and approved?
- (d) How are inspection openings and corrosion allowance identified on the *Manufacturer's Data Report*?

- (e)
- (f) Are all the required provisions of Charpy impacts identified, including exemptions specified in Section VIII, Divisions 1, 2, and 3, and Section XII?
- (g) Review of drawings and calculations with the Inspector, prior to the start of fabrication, so that the traveler or checklist may be marked with selected hold points or inspection points.
- (h) How are job orders, numbering systems, etc., controlled, if used?
- (i) Who specifies materials to be used in Code fabrication? Are materials specified as SA, SB, or other Code acceptable material specifications for which allowable stresses are listed in the applicable Code sections? Are welding materials specified as SFA, AWS, or other methods traceable to the Welding Procedure Specification (WPS)?
- (j) How are engineering and manufacturing drawings, including the latest applicable revisions, issued, and retrieved? How superseded drawings are disposed of, and are there provisions to issue and retrieve drawings at field sites, if applicable? If as-built drawings are used, how are they controlled and reconciled to design requirements?
- (k) Who reviews and approves drawings?
- (l) What additional information is identified on the approved drawings, i.e., Code Edition, pressure, temperature, minimum design metal temperature (if applicable), NDE, heat treatment, weld details, welding procedures, materials, etc., or is the information dispensed by other means?
- (m) How is purchasing informed of materials to be procured (material requisitions, bill of materials, electronic systems, etc.)?
- (n) Field controls.

2.7.1 Additional Requirements for Section VIII, Division 1 and Division 2

- (a) Sections VIII, Divisions 1 and 2 contain unique requirements, and the Manufacturer performing work to this division must show how these requirements are satisfied within the framework of the Quality Management System. ASME Section VIII, Division 1 and Division 2 requirements are similar with minor differences in this element, for example Class 1 and Class 2 requirements only apply to Division 2. Personnel performing design activities for ASME Section VIII Division 1 must meet the Appendix 47 requirements.
- (b) A User's Design Specification is required per 2.2 of Section VIII, Division 2. The Design Specification shall contain the following detailed information:
 - (1) installation site;
 - (2) vessel identification;
 - (3) vessel configuration and controlling dimensions;
 - (4) design conditions;
 - (5) operating conditions;
 - (6) design fatigue;

- (7) materials;
 - (8) loads and load cases;
 - (9) overpressure protection; and
 - (10) additional requirements as appropriate for the vessel service.
- (c) The Applicant is responsible for the structural and pressure-retaining integrity of a vessel or vessel part. The vessel or vessel part shall comply with the requirements of Section VIII, Division 2, and the User's Design Report. The Applicant shall provide and maintain construction records per 2.3.5 of Section VIII, Division 2. The User Design Specification will be certified per Annex 2.A and the *Manufacturer's Design Report* will be certified per Annex 2.B of Section VIII, Division 2. The *Manufacturer's Design Report* shall include the following information:
- (1) final as-built drawings;
 - (2) actual materials used for each component;
 - (3) design calculations and analysis;
 - (4) any fatigue analysis; and
 - (5) assumptions used in the design.

2.7.2 Additional Requirements for Section VIII, Division 3

- (a) Section VIII, Division 3 contains the same basic requirements as Section VIII, Division 2, as specified in 2.7.1 of this section of the Guide; except that the details required in the User's Design Specification are identified in KG-311, and some marked differences in the *Manufacturer's Design Report*, as identified in KG-323 and KG-324. Section VIII, Division 3 also identifies the requirements for a designer, who is an individual engineer or group of engineers, experienced in high pressure vessel design who performs the required analysis of the vessel.
- (b) The User's Design Specification shall contain sufficient detail to provide a complete basis of Section VIII, Division 3 design and construction requirements. The User's Design Specification shall contain the following information:
- (1) vessel identification;
 - (2) vessel configuration;
 - (3) controlling dimensions;
 - (4) design criteria, such as design pressure, design temperature, minimum design metal temperature, and thermal gradients;
 - (5) operating conditions;
 - (6) contained fluid data;

- (7) material selection;
 - (8) loading;
 - (9) useful operating life expected;
 - (10) fatigue analysis;
 - (11) overpressure protection and any additional requirements specified by the user;
 - (12) installation site; and
 - (13) certification by a Professional Engineer registered in one or more states of the United States, or provinces of Canada.
- (c) Also, as required by this division of the Code, the Applicant, or his designated agent of Section VIII, Division 3 pressure vessels, is responsible for a design report consisting of design calculations and analysis that the design as shown in the drawings, including as-built changes, complies with the requirements for the design conditions that have been specified in the User's Design Specification. The *Manufacturer's Design Report* must also include the following information:
- (1) final and as-built drawings;
 - (2) results of fatigue analysis, according to Article KD of Section VIII, Division 3;
 - (3) documents for consideration of the effects of heating, or heat treatment during manufacturing, and similarly, the maximum metal temperature specified which indicates the material properties or pre-stress used in the design are not adversely affected;
 - (4) statement of any openings for which closures have not been installed; and
 - (5) limiting thermal gradients across the vessel section and certification of the Manufacturer's design by a Professional Engineer registered in one or more states of the United States or provinces of Canada.

2.7.3 Additional Requirements for Section X, Fiber-Reinforced Pressure Vessels

- (a) Class I Fiber-Reinforced Pressure Vessels
 - (1) Provisions for review of the Design Specification that requires that the vessel be designed, fabricated, tested, and certified in accordance with Section X. Also, the Design Specification shall establish information for operating conditions, including intended use and material compatibility with the contents, in such detail to provide the basis of design, material selection, fabrication, and inspections. (RG-310)
 - (2) Provisions for requirements of structural integrity of the vessel or parts, including the capability to contain pressure and conformance with the *Design Report* certified by the fabricator. (RG-320)

- (3) Provisions that the fabricator shall provide design calculations for vessels and vessel parts. The design calculations shall only provide a tentative determination that the design, as shown on the drawings, complies with the requirements of Section X, for Class I vessels. [RG-321 (a)]
 - (4) For vessels used for potable water, the fabricator's design report shall indicate suitability of potable water use. [RG-321.1(b)]
 - (5) Provisions that the responsibility of the fabricator to prove that the vessel designed will safely withstand the service conditions set forth in the Design Specification. This proof shall consist of subjecting one or more prototype vessels to tests as required by the rules of Section X. [RG-321.1(c)]
 - (6) Provisions for preparing and qualifying a procedure specification that shall specify the materials and the procedures employed to fabricate a prototype vessel and production vessels to safely withstand the test and service conditions set forth in the Design Specification. [RG-321(d)]
 - (7) Provisions for performing Quality Control and Production Tests per Articles RT-3 and RT-4 respectively. [RG-321.1 (e) and (f)]
 - (8) Provisions for preparation and certification of the *Design Report*. [RG-321(e)]
- (b) Class II Fiber-Reinforced Pressure Vessels
- (1) Provisions for review of the Design Specification that requires that the vessel be designed, fabricated, tested, and certified in accordance with Section X. Also, the Design Specification shall establish information for operating conditions, including intended use and material compatibility with the content, in such detail to provide the basis of design, material selection, fabrication, and inspections. (RG-310)
 - (2) Fabricator's responsibility for design calculations. The calculations shall constitute the basis for thickness of parts subjected to pressure, number of plies, ply orientation, and other fabrication details. The calculations shall be part of the *Design Report*. [RG-321.2(a)]
 - (3) Provisions for the fabricator to prepare and certify the Procedure Specification. The Procedure Specification shall specify the materials and fabrication procedures used to fabricate the vessel. [RG-321.2 (c)]
 - (4) Provisions for preparation and certification of the *Fabricator's Design Report*. [RG-321.2(e)] It shall include a Design Specification, Design Drawings, Tentative Design Calculations, Material Manufacturer's lamina specification sheets, certified RP-4 for parts, Procedure Specification, Acceptance Test Results, and documentation of the elastic and strength properties of the lamina.
 - (5) It is required that the design calculations contained in the *Fabricator's*

Design Report be certified by a professional engineer registered in one or more states of the United States or provinces of Canada knowledgeable in the design of reinforced plastic pressure vessels. This certification shall indicate that the design calculations are compliant with Section X. (RD-1111)

2.8 Repair and Alteration

- (a) For National Board *Certificate of Authorization* Applicants, the manual shall include controls for repairs and alterations, including the selection of welding procedure specifications, materials, nondestructive examination methods, and preheat and postweld heat treatment. If applicable, the manual shall include provisions for using the alternate welding methods, as specified in Part 3, Section 2 of the *National Board Inspection Code*, ANSI/NB-23. Furthermore, the Quality System Manual shall include provisions for controlling routine repairs, if applicable.
 - (1) Does the Quality System Manual identify the scope and limitations of the routine repair program?
 - (2) Is the routine repair program acceptable to Jurisdiction where the pressure-retaining item is installed?
 - (3) Are there provisions for documenting routine repairs in the Remarks Section of Form R-1, which states “Routine Repairs”?
 - (4) Does the Quality System Manual describe the process for identifying, controlling, and implementing Routine Repairs?
- (b) The Manual shall specifically indicate that before work is started, acceptance of the repair/alteration shall be obtained from an Inspector who will make the required inspections and confirm *National Board Inspection Code* (NBIC) compliance by signing the applicable NBIC report form upon completion of the work.
 - (1) Are there provisions for preparing, certifying, distributing, and if required, registering Forms R-1, R-2, R-3, and R-4 with the National Board?
 - (2) Are there provisions for the Certificate Holder to present Forms R-1, R-2, R-3, and R-4 to the Inspector for acceptance and signature?
- (c) The manual shall describe the methods for performing and documenting repairs and alterations in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed. The method of repair or alteration must have prior acceptance of the Inspector.
- (d) The manual shall make provisions for the Inspector to have access to all drawings, design calculations, specifications, procedures, process sheets, repair or alteration procedures, test results, and other documents necessary for the Inspector to ensure compliance with the NBIC. A copy of the current manual shall be available to the Inspector.

2.9 Material Control

- (a) Materials for pressure containing items and welding consumables used in Code construction are closely controlled throughout the manufacturing process. This control is established by each Code Section limiting the materials which may be used. Are controls in place on materials for pressure containing items and welding consumables used in Code

construction?

- (b) Are ASME SA, SB, Code Case Materials, or other Code accepted materials being used as required by the Code of construction as specified by engineering documents?
- (c) Are welding consumables in accordance with SFA specifications or as stated on qualified Welding Procedure Specifications (WPS)?
- (d) How are the governing Code Editions and cases for pressure vessels and parts established?
- (e) Do the materials conform to one of the specifications listed as approved for use in the Edition specified for construction, or as approved by the Code of Construction for use in the Guideline for Acceptable ASTM Editions or in the Guideline for Acceptable Non-ASTM Editions in Section II, Part A or Part B?
- (f) Are controls in place for the recertification of materials as permitted by the applicable Code of Construction? See the appropriate Section for applicable rules.
- (g) For National Board *Certificate of Authorization* Applicants, the manual shall describe the method used to ensure that only acceptable materials (including welding material) are used for repairs and alterations. The manual shall include a description of how existing material is identified and new material is ordered, verified, and identified. Does the manual identify the title of the individual(s) responsible for each function and a brief description of how the function is to be performed?
- (h) The controls must consider and follow all requirements for the Code of Construction and the applicable material specifications. The following is a Guide as to questions and issues to be considered:
 - (1) Who is responsible for ordering materials, and who establishes the material requirements for Code compliance?
 - (2) Are substitutions of materials allowed; by whose authority; and is there Inspector involvement?
 - (3) Are purchase orders complete with all necessary information required by the Material Specification and the applicable Code section?
 - (4) Are *Material Test Reports* or *Certificates of Compliance* required by the Code of Construction for all materials to be used, or as specified by the ASME Section II Material Specification?
 - (5) What is the distribution of purchase orders? Are they checked for correctness prior to issue? Does the receiving inspection department/person receive a copy?
 - (6) Is the purchase order traceable to the job order number, if used?
 - (7) For steel products that are cold-formed by a subcontractor, are the requirements of UG-79 given due consideration and certification, checked upon receipt of formed items? (It should be noted that UG-79 and UHA-44 are only applicable for Section VIII, Division 1 pressure vessels.) Cold-forming is also permitted in Section I for austenitic materials if all the requirements of PG-19 are satisfied.
 - (8) Who receives material? What quality control input is provided? How are

materials and fabricated parts inspected upon receipt?

- (9) Are required *Material Test Reports*, *Certificate of Compliance*, or other documents submitted to the Inspector for review of acceptability of materials? (All Code sections).
- (10) What system(s) of marking (stickers or tags), is used for various material for identification and traceability requirements?
- (11) How are nonconforming materials handled? Who is responsible to segregate, mark, or tag nonconforming material(s)? Who is responsible for resolving nonconformances? This may be covered under correction of nonconformances.
- (12) Who reviews *Certificate of Compliance* and *Material Test Reports* for compliance with the Material Specification of Section II of the ASME Code?
- (13) Are *Material Test Reports* traceable to the job order number and purchase order? Who files them and where?
- (14) If ASTM material is received, is the material verified for acceptability by Code Edition and reconciled as required by Section II, Appendix II, of the ASME Code?
- (15) Are standard pressure parts that are fabricated by welding, and do not require *Manufacturer's Partial Data Reports*, verified for Code compliance?
- (16) How are materials issued or released for fabrication? This may be covered under the Examination and Inspection Program section of this Guide.
- (17) Field controls.

2.9.1 Additional Requirements for Section VIII, Division 2

- (a) Are certified *Material Test Reports* required? Does the certified *Material Test Report* identify the additional requirements of 3.2.6 of Section VIII, Division 2?
- (b) Casting quality factors of Section VIII, Division 1 do not apply. All steel castings shall be examined per the requirements of 3.8.2 of Section VIII, Division 2.
- (c) Requirements for impact testing of materials are extensive. When ordering materials, see 3.11 of Section VIII, Division 2.
- (d) It is also worthy to note that Section VIII, Division 2 makes no provisions for the use of unidentified material by tests on each piece, such as found in Section I, PG-10, and Section VIII, Division 1, UG-10. Only Code-approved materials shall be used in Section VIII, Division 2 construction.

NOTE: The material tables of Section VIII, Division 2 contain curtailed listings of allowable materials, but with higher allowable stress values.

2.9.2 Additional Requirements for Section VIII, Division 3

- (a) Section VIII, Division 3 is more restrictive in the use of material, as provided for in Section VIII, Divisions 1 and 2. Some of the major differences are that the material Manufacturer shall certify that all the requirements of the applicable

Material Specification in Section II, and all the special requirements of Part KM, which are to be fulfilled by the material Manufacturer, and all supplementary material requirements specified by the User's Design Specification have been complied with. Also, it appears that Section VIII, Division 3, does not permit exemptions for notch toughness testing of materials, except for nuts, washers, and materials which do not contribute to the integrity of the pressure boundary. (KM-230)

- (b) Furthermore, Section VIII, Division 3 requires ultrasonic examination of all product forms used for pressure-retaining materials, i.e., plate, piping, forgings, and bars, prior to acceptance.
 - (1) Corrosion-resistant or abrasion-resistant materials may be any metallic or nonmetallic material suitable for the intended service conditions as specified in the User's Design Specification.
 - (2) Does the definition for thickness satisfy Section VIII, Division 3 requirements for plate, forgings, bars, bolting, and pipe materials?
 - (3) Are procedures required for obtaining test specimens and coupons for testing austenitic stainless steels and nonferrous alloys that conform to the applicable material specification, since these materials are exempt from the requirements of KM-211, Section VIII, Division 3?
 - (4) Are there provisions for pressure-retaining component materials, other than bolting, not containing welds?
 - (5) Are there provisions for pressure-retaining component materials containing welds?
 - (6) Are there provisions for fracture toughness requirements?
 - (7) Are there provisions for heat treating separate test specimens for materials used in Section VIII, Division 3 fabrication?
 - (8) In determining stress values for materials permitted by Section VIII, Division 3, use Table Y-1 for yield strengths, and Table U-2 for the tensile strength of SA-231 and SA-232 materials (KM-400).
 - (9) Mechanical testing for tension and Charpy V-notch tests shall be conducted on representative samples of all materials used for construction of Section VIII, Division 3, pressure vessels, except Charpy V-notch testing is not required for nuts, washers, and materials, which do not contribute to the integrity of the pressure boundary.

2.9.3 Additional Requirements for Section X, Fiber-Reinforced Plastic Pressure Vessels

- (a) The materials permitted by Section X are limited to glass, carbon, graphite, or aramid. Materials for fiber-reinforced plastic are designated as laminates, except for metal parts. Metal parts used in conjunction with laminates on Section X vessels shall satisfy Section VIII, Division 1 requirements. Laminate materials permitted for use in fiber-reinforced plastic pressure vessels are glass, carbon, graphite, or aramid fibers. Furthermore, the fiber material must be able to withstand a minimum strength and modulus measurement. This test shall be in

accordance with ASTM D2343, and the results shall not be less than 90% of the Manufacturer's published minimum for resin-impregnated strands (RM-1, RM-211).

- (b) In addition to the fiber materials, fiber-reinforced plastic pressure vessels use resins, which consist of an epoxy polyester/vinyl ester, phenolic, or furan resin, plus the resin Manufacturers recommended promoters and curing agents (RM-120).
 - (1) Provisions for receipt and acceptance of material Manufacturer's certification that fibers used conform to the Manufacturer's specification for the minimum strength and modulus of elasticity (RM-112).
 - (2) Provisions for resin materials and promoters (RM-120).
 - (3) Provisions that filler, pigments, thixotrope, or dye which will interfere with the natural color of the resin shall not be used, except as permitted by the Procedure Specification (RM-120).
 - (4) Provisions that if the vessel is to be painted, that the painting process will only be permitted after all required inspections and certification have been performed (RM-120).
 - (5) Provisions for maintaining and monitoring shelf lives for all resins (RM-121, RM-100).
 - (6) Provisions that the Fabricator shall test each batch of resin to ensure that the material characteristics have not changed from values specified in the Procedure Specification (RM-121).
 - (7) Provisions that the curing agents used, and curing procedure followed, in the vessel fabrication shall be specified in the Procedure Specification (RM-122).
 - (8) Provisions for interlaminar shear strength testing in accordance with ASTM D2344 for Class III filament-wound vessels. (Appendix 8-300.6) See A.5 for Class III vessels.
 - (9) Provisions for determining the mechanical properties of lamina for Class II vessels (RT-7).

2.10 Welding Control

- (a) Is there a statement made in the Quality System Manual that all welding shall conform to the requirements of the Code of Construction?
- (b) For National Board *Certificate of Authorization* Applicants, the manual shall include controls for repairs and alterations, including the selection of the Welding Procedure Specifications (WPS), materials, nondestructive examination methods, and preheat and postweld heat treatment. If applicable, the manual shall include provisions for using the alternate welding methods, as specified in Part 3, Section 2 of the *National Board Inspection Code*, ANSI/NB-23.
- (c) Who prepares WPSs? How are they documented? How are revisions controlled? Are changes to essential, nonessential, and when required, supplementary essential variables

and revisions identified, dated, and controlled?

- (d) Who is responsible for conducting qualification tests and are the ASME Section IX, QG-106 requirements adequately addressed? Are the qualification tests under the direct supervision and control of the Manufacturer for the WPS and documenting the results on the Procedure Qualification Record (PQR)? Who certifies the PQR for the company? Who is responsible for assigning the WPS for Code welding, repair welding, welding of attachments, and tack welds? How are WPSs assigned for Code welding, e.g., route sheet, traveler, drawing, checklist, etc.? Are WPSs or welders used or furnished by other divisions of the same company (operational control QW-201.1 and QW-300.2 of Section IX)? Are the controls adequate?
- (e) How are performance qualifications of welders and welding operators documented, dated, and certified by the company representative?
- (f) Are records of welder's qualifications for various welding processes maintained (welder's log), ensuring the 6-month requirement?
- (g) Are copies of the applicable WPS made available to welders and welding operators in the work area? How does the welder or welding operator receive directions, or instructions for Code welding in accordance with the WPS? Are WPSs attached to travelers, drawings, or welder instruction cards?
- (h) Does the Quality System Manual specify the right of the Inspector to require requalification of welders?
- (i) How are welding materials ordered, received and stored prior to use?
- (j) Is heated storage specified for covered electrodes, such as low hydrogen and stainless steel, after removal from their sealed containers? Are covered electrodes, such as low hydrogen and stainless steel, stored in accordance with the welding material Manufacturer's recommendations, or Part C of Section II of the ASME Code?
- (k) How are issue and return of welding materials controlled? Who is responsible?
- (l) How are production welds identified by the welder or welding operator (stamps, weld maps, etc.)?
- (m) How are tack welds treated? Are they prepared prior to inclusion in the weldment by grinding, brushing, etc., or are they removed? Are tack welds visually examined for defects and if defective, are they removed? If included in weld, are approved welding procedures and qualified welders used? How are WPSs assigned? How are tack welders assigned?
- (n) Who is responsible for instructing, supervising, and assigning welders and welding operators for Code welding? How are welders and welding operators assigned?

2.10.1 Additional Requirements for Section VIII, Division 3

- (a) When using subcontracted welders under the provisions of Section VIII, Division 3, the welders shall be in the employ of a Manufacturer that possesses a valid "U", "U2", or "U3" *Certificate of Authorization* issued by ASME, as required by KG-420.
- (b) Are there provisions that no welding of any kind shall be carried out when the temperature of the metal surface within 3 in. (76 mm) of the point of welding is

lower than 60°F (16°C)? (KF-206)

- (c) Are there provisions that finished welds shall be ground or machined to blend with the surface of the parts being joined?
- (d) Are there provisions for supplementary requirements for materials with welding restrictions as required by Article KF-7?
- (e) Are there provisions for welding restrictions for wire-wound vessels and frames?

2.11 Nondestructive Examination (Not Applicable to Section IV)

- (a) Does the Quality System Manual define requirements for nondestructive examination methods in accordance with the applicable ASME Code sections?
- (b) Who is responsible for determining if NDE is required or not?
- (c) Is NDE performed in-house, subcontracted, or both?
- (d) Does the Applicant have documented evidence that a Level III Examiner has been accepted? Note: The Level III examiner may be an employee of the company or subcontracted.
- (e) Personnel performing radiographic (RT) and ultrasonic (UT) examinations must be qualified, certified, and their qualifications and certifications documented to the requirements of the Employer's written practice or central certification program.
- (f) Nondestructive examiners in the liquid penetrant and magnetic particle methods may be certified as competent in performing examinations and interpreting results by the Certificate Holder. The Employer is responsible for verifying visual examiners (VT) for ASME B31.1, Paragraph 136.3.2.
 - (1) Are there requirements for an annual near-vision test, and a requirement for a color contrasting differentiation for NDE examination?
 - (2) Are controls in place for verifying visual examination (VT) are performed in accordance with Section I, paragraph PG-75 requirements?
- (g) Are controls in place for verifying visual examination (VT) are performed in accordance with ASME B31.1, Paragraph 136.4.2 requirements described in Section V, Article 9? Does the VT Procedure address the Acceptance Standards outlined in B31.1 Paragraph 136.4.2? Are personnel who perform visual examination of welds qualified and certified in accordance with ASME B31.1, Paragraph 136.3.2 including an eye examination performed at least once each year to determine optical capability?
- (h) As required by the Code of construction, who is responsible to assure all NDE procedures are demonstrated capable of producing meaningful results to the satisfaction of the Inspector as specified in Section V, Article 1, paragraph T-150.

2.11.1 Additional Requirements for Section VIII, Division 2

- (a) Section VIII, Division 2 NDE requirements differ significantly from the requirements of Section VIII, Division 1.
- (b) Offset (joggle) joints are prohibited per 6.2.4.2 of Section VIII, Division 2.

- (c) Has an NDE examination group been selected for required NDE per Table 7.1? Does the drawing and/or traveler specify the extent of NDE to be performed (see Table 7.2)?
- (d) If there is a specific reason to question the NDE operators' (examiners') qualifications, the Inspector has the right to require proof of the operators' (examiners') ability to perform and interpret the examination specified in 7.A.3.2.6 of Section VIII, Division 2.

2.11.2 Additional Requirements for Section VIII, Division 3

- (a) The major difference between Section VIII, Divisions 1, 2, and 3, is that Division 3 requires that Ultrasonic Examination (UT) is the primary NDE method for all materials used under this section of the ASME Code, however Radiography (RT) may be used if UT cannot resolve embedded flaws, or the geometry is not conducive to use UT.
- (b) All methods of NDE, i.e., Radiographic Examination (RT), Ultrasonic Examination (UT), Magnetic Particle (MT), Liquid Penetrant (PT), Eddy Current (EC) shall be performed to written procedures in accordance with Section V of the ASME Code.
- (c) NDE Examiners shall be qualified in accordance with Section V, Article 1, T-120 (e) through T-120 (g), and T-120 (i) through T-120 (k) as applicable per KE-112.
- (d) NDE written practice and procedures used for examination of personnel shall be referenced in the Employer's Quality System Manual, as required by KE-112.
- (e) Visual NDE examiner's physical examination shall be to Jaeger 1 or equivalent.
- (f) The Certificate Holder has the responsibility of verifying qualifications and certification of nondestructive examination personnel employed by the material Manufacturer, material supplier, and material organizations subcontracted by the Certificate Holder, as required by KE-114.

2.12 Heat Treatment (Not Applicable to Section IV)

- (a) Heat treatment is used almost exclusively in Section I and Section VIII, Divisions 2 and 3. Under specific exemptions of the above referenced Code sections, heat treatment is not required. For Section VIII, Division 1 and Section XII, due to the differing types of products, many Certificate Holders fabricating vessels are not required to perform stress-relieving heat treatment of completed vessels or parts. If this is the case, a statement in the Quality System Manual, such as the following, could suffice for Section VIII, Division 1 and Section XII vessels only:

“Due to material type and limitations on thickness of materials used in Code fabrication, no heat treatment is required or used. If required in the future, this section will be revised to include the proper controls.”

- (b) Where heat treatment is used, either in-plant facilities or on an outside-the-plant subcontracted basis, the Quality System Manual should address the following:
 - (1) Who prepares or approves written heat treatment procedures or heat treatment instructions? Does the heat treatment procedure or heat treatment instructions satisfy ASME Section II requirements?

- (2) If heat treatment activities are performed to satisfy the Code of Construction requirements by the Certificate Holder, who within the organization is responsible for following the procedures or instructions provided? Does the Quality System monitor heat treatment activities, as required by the heat treatment procedures or heat treatment instructions? Who reviews heat treatment charts or records, to ensure compliance with heat treatment procedures or heat treatment instructions? What extent of servicing and calibration is required for heat treatment equipment?
- (3) For National Board Certificate Applicants, does the manual address the use of alternative welding methods per NBIC Part 3, 2.5.3 postweld heat treatment (PWHT) methods? How are alternatives to PWHT controlled? Alternative welding methods to PWHT require MT or PT prior to use and in some cases RT. The necessary controls must be addressed in the NDE section of the Quality System Manual.
- (4) If subcontracted, are measures provided to ensure proper performance and calibration, as well as proper records of heat treatment, such as dated strips or dial charts and purchase order or job order, and are the records signed by the operator or other subcontracted personnel?
- (5) Are all heat treatment records made available to the Inspector for review?
- (6) What controls (numbering, tagging, stamping) are provided to identify materials and parts sent to subcontractor's facilities for heat treatment? Is there a receiving inspection performed by the Certificate Holder when the heat treated item is returned to ensure that the Certificate Holder receives the correct part and that the item is not damaged?
- (7) Are test specimens or coupons specified and tested where required by the Code section?
- (8) Are Brinell hardness tests available (forged vessels)?

2.13 Examination and Inspection Program

- (a) This is the heart of the Quality System Manual, and all too frequently is not adequately described. This section of the Quality System Manual should describe operations commencing with issuance of materials from stock, cutting, forming, fabricating, final pressure testing, final inspection, application of the ASME Certification Mark with the appropriate Designator, and preparation, signing, and distributing the *Manufacturer's Data Report*, or the appropriate National Board Form "R" Reports (R-1, R-2, etc.) when applicable.
- (b) Descriptions of technical processes are not needed, as these descriptions are addressed in succeeding sections of the Quality System Manual; however, reference to these sections is helpful on occasion. A description of the documents used to control the above listed functions (who issues them and how are they used) is required. This is particularly true of the traveler, process sheets, or checklists used to record various stages of production, examinations and inspections by quality control personnel, inspection by the Inspector, and the final tests and inspections. Furthermore, the Quality System Manual shall include provisions for controlling routine repairs, if applicable.
 - (1) Are travelers, process sheets, or checklists provided for important stages of fabrication? Do these forms provide for sign-offs and date of examinations performed by quality control personnel? Is a column or other means provided for

sign-off and date for inspections performed by the Inspector? How are these entries identified on the travelers, process sheets, or checklists? Do these forms provide for revision control?

- (2) Is there a review of the traveler, process sheet, or checklist with applicable drawings provided to the Inspector, prior to start of production or repair/alteration to designate desired inspections as work progresses?
- (3) Are *Material Test Reports* or *Certificates of Compliance* required for plate material as specified by the Code of Construction and/or the ASME Section II Material Specification? For other product forms, is the material marked, identified, or certification supplied per requirements of the Code of Construction (PG-11, UG-11, or Material Specification)? How are certifications made available to the Inspector?
- (4) Are material identifications transferred prior to cutting material into two or more pieces, or are there provisions in the manual for transfer after cutting (UG-77 & PG-77)? What type of system is used, e.g., color coding, coded marking system, tabulation, as-built drawing, etc.?
- (5) Who is responsible for notifying the Inspector in advance of reaching designated inspection and hold points?
- (6) Does the traveler, process sheet, or checklist indicate Welding Procedure Specification(s), NDE procedures, and heat treatment procedures (including revision levels), or are other controls provided for these functions and procedures? Who specifies the foregoing? Who reviews the resulting reports for Code compliance?
- (7) Who is responsible and how are the pressure test requirements specified for the applicable Code of Construction? Who is responsible for conducting final pressure tests? Who monitors these tests, performs inspections, and documents the results? Who is responsible to verify the dial range of gages used for the pressure tests?
- (8) In the event of pneumatic tests (Section VIII, Division 1), are the applicable provisions of UG-100 and UW-50 provided for?
- (9) Are welded repairs to pressure-retaining parts or materials referred to the Inspector prior to performing such repairs? Who is responsible to specify the WPS to be used for welded repairs? How are welded repairs documented?
- (10) For Section I application, is the ASME Certification Mark and Designator applied in the presence of the Inspector? For the other Code Sections, is the Certification Mark and Designator applied only with the concurrence of the Inspector? If the Manufacturer is prestamping name plates for pressure vessels and heating boilers, is the system described in the Quality System Manual, and is the system acceptable to the Inspector?
- (11) Who is responsible for custody of the ASME Certification Mark(s) and the National Board Code Symbol?
- (12) Who is responsible for preparation and are checks made for correctness and completion of the *Manufacturer's Data Report* or the appropriate National Board Form "R" Reports? Who certifies the *Manufacturer's Data Report* for the Manufacturer prior to presenting the *Manufacturer's Data Report* to the Inspector

for signature?

- (13) Who checks accuracy of nameplate data or stamping on the boiler, pressure vessel, or power piping?
- (14) Is distribution and retention, or National Board registration of the *Manufacturer's Data Reports* and/or the appropriate National Board Form "R" Reports provided for?

NOTE: National Board registration is highly recommended, for all Manufacturers and is mandatory in most North American Jurisdictions. For distribution and retention of *Manufacturer's Data Reports*, refer to the applicable ASME Code sections for specific requirements. (See 2.18 and 2.21 of this Guide.)

- (15) If the Manufacturer's Quality System Manual has provisions for extensions for field activities, does the Quality System Manual establish and implement all the required elements as established by the applicable ASME Code sections?

2.13.1 Additional Requirements for Transfer of Parts [UG-120(c)(1)(-e), PG-106.8.4, HG-520.2(c)]

- (a) Manufacturers with multiple locations under the operational control of a single organization, each location with its own *Certificate of Authorization*, may transfer welded or brazed pressure vessel parts, or completely welded pressure vessels that have not been pressure tested or received final inspection, from one location to another without Partial Data Reports, provided the Quality Management System describes the method of identification, transfer, and receipt of the parts. These methods shall include the following requirements:
 - (1) Who is responsible for the identification requirements including verification of the details of the specific marking to be applied? What methods of identification will be used on each part? Will the method selected be legible, permanent, and not detrimental to the part? Who is responsible to ensure these controls are met?
 - (2) Who is responsible for the transmittal form that is included with each transfer? Does the transmittal form list all items with corresponding identification numbers, with indication that the items do not contain the Certification Mark? Who is responsible to sign the transmittal form?
 - (3) Who is responsible at the receiving location to inspect each item upon receipt?
 - (4) What controls are in place for the Manufacturer of the completed vessel to retain all transfer forms as part of the vessel records? (See Mandatory Appendix 10, 10-13).
 - (5) Who is responsible for providing the traveler including controls for transfer to the Authorized Inspector prior to the start of fabrication for setting hold points and final shipment?
 - (6) It is recommended to address controls for what documentation needs to be included with transfer form(s) accompanying the product, such as; material test reports, inspection results of the product (i.e., Traveler), NDE reports and welder/welding operator qualifications.
 - (7) Who is responsible to make the transfer form(s) and any included

documentation available to the Authorized Inspector?

2.13.2 Additional Requirements for Section VIII, Division 2

Manufacturer's Construction Records: The Manufacturer shall prepare and maintain construction records and documentation to show compliance with the *Manufacturer's Design Report* as fabrication progresses per 2.3.5.

Does the Manufacturer's Design Report include both the minimum test pressure per 8.2.1 (a) and the upper limit test pressure per 8.2.1 (c)?

NOTE:

The upper limits of the test pressure shall be determined using the method in 4.1.6.2, 5.2.2.5, 5.2.3.6, or 5.2.4.5.

A detailed examination of welds and high stress areas is required at reduced pressure following pressure tests. This examination is to be witnessed by the Inspector per 8.2.5.

Impression stamping of vessel shells shall comply with 2-F.5. Nameplate data is based on design pressure and temperature. Minimum permissible temperature is required on the nameplate. See Figure 2-F.1 of Section VIII, Division 2 for the form of the stamping.

For distribution and retention of ASME *Manufacturer's Data Reports* see 2-C.3, 2.18 of this Guide.

2.13.3 Additional Requirements for Section VIII, Division 3

- (a) Unlike Section VIII, Divisions 1 and 2, Section VIII, Division 3 requires, in addition to several added requirements, a *Manufacturer's Construction Record*. As a minimum, the *Manufacturer's Construction Record* shall contain the records specified in KS-320.
- (b) Manufacturer shall provide documentation and records with ready and timely access for the Inspector, and perform the other actions as required by Section VIII, Division 3, as required in KG-414.
- (c) Testing requirements must satisfy Article KT-1.
- (d) Requirements for impact testing of welds are required by Article KT-2.
- (e) Hydrostatic tests must satisfy the requirements of Article KT-3.
- (f) Pressure gages and transducers shall be calibrated against a standard dead weight tester or a calibrated master gage at least every six months.
- (g) Required markings and stampings shall satisfy Article KS-1.

2.13.4 Additional Requirements for Section X, Fiber-Reinforced Plastic Pressure Vessels

- (a) The production flow and in-plant inspection check-off is a basic production flow procedure, including in-plant inspection and check-off points, and a means of recording the inspection activity. This procedure shall also ensure that drawings specified in the Procedure Specification are used in fabrication of Section X

Fiber-Reinforced Plastic Pressure Vessels (Appendix 1-110).

- (1) Provisions that the production flow and in-plant inspection check-offs are developed from requirements of the Fabricator's Procedure Specification.
- (2) Provisions for the review and approval of the production flow and in-plant inspection check-off documents.
- (3) Provisions for the review and insertion of inspection points by the Inspector.
- (4) Provisions, if required for revisions and how controlled, to the production flow and in-plant inspection and check-off documents.
- (5) Provisions for retrieval of the production flow and in-plant inspection and check-off document (Q-120) maintained as part of the Fabricator's Design Report (RG-321).
- (6) Provisions for qualification checks, examinations, and inspections of each prototype vessel, and production vessels for Class I, and qualification checks, examinations, and inspections for each Class II vessel.
- (7) Provisions for verifying weight of resins and fibers for Class I vessels (RT-212, RT-320).
- (8) Provisions for Barcol Hardness Tests (RT-221 and RT-440).
- (9) Provisions for weighing each prototype/ production vessel for Class I requirements (RT-213, RT-430).
- (10) Provisions for determining cyclic pressure and hydrostatic pressure qualification tests for Class I vessels (RT-223, RT-310).
- (11) Provisions for repair of imperfections of Class I vessels (RT-412).
- (12) Provisions for conditions under which a pneumatic leakage test may be used (RT-460).
- (13) Provisions for hydrostatic testing procedures for Class I and Class II vessels (RT-450, RT-620).
- (14) Provisions for preparing and certifying the Fabricator's Data Report (RG-322).
- (15) Provisions for applying the Code Certification Mark and "RP" Designator (RS-1).
- (16) For Class III vessels, see A.5.

2.14 Calibration

- (a) Who is responsible for calibration and how are these requirements accomplished?

- (b) Does the Quality System Manual refer to written calibration procedures?
- (c) What method is used for equipment identification?
- (d) What types of status indicators are used: stickers or tags?
- (e) Do status indicators show the date of calibration and when the device needs to be calibrated again?
- (f) What is the method of record keeping? Are cards or labels used? Are all measurement and test equipment under a calibration program (examination, measuring and test equipment)?
- (g) Who is responsible to maintain an electronic or paper master list of items requiring calibration?
- (h) Hydrostatic test gages must be calibrated as specified by the applicable Code section or division. If not specifically required by the Code section or division, does the Quality System Manual identify the calibration frequency?
- (i) Frequency of calibration in (b) above does not necessarily have to be stated in the Quality System Manual, provided it is controlled by a card system, separate written procedure, or other means that the Certificate Holder may choose.
- (j) Notch Toughness (Charpy Impact) tests and apparatus used shall conform to the applicable requirements of SA-370 (UG-84). For calibration requirements, SA-370 references ASTM, E-23, which requires an annual calibration of Charpy Impact test machines and a semi-annual calibration of temperature measuring apparatus.
- (k) Who is responsible to ensure that the Manufacturer's Proof Test Report includes sufficient detail to describe the instrumentation and the methods of calibration used?

Other practical questions:

- (1) Who is responsible to determine which items are to be calibrated?
- (2) Who is responsible for the disposition of the items to be calibrated?
- (3) What type of documentation is used or required for calibration and certification?
- (4) Describe how items in the calibration system are identified.
- (5) Explain the method used for calibration status.
- (6) Describe controls for subcontractor calibration requirements.
- (7) Explain how calibration of measuring and testing equipment used by outside contractors shall be verified, and by whom.
- (8) Explain master gage calibration frequency, and who is responsible.
- (9) Explain method and frequency of calibration for linear measuring devices.
- (10) Explain control of calibrated items.
- (11) Describe how items with questionable calibrations are handled.

- (12) Are calibration records made available to the Authorized Inspector?
- (13) How is the disposition of discrepant equipment or items checked with out-of-calibration equipment handled?

2.15 The Inspector

Many of the provisions for the Inspector may have been covered in other sections of the Quality System Manual, but redundancy is sometimes desirable rather than cross-referencing throughout the text of the Quality System Manual for specific requirements for the Inspector. The Inspector's section should contain, as a minimum, the following:

- (a) as defined in the applicable Code of Construction, Inspector could be an AI, Qualified Inspector, or Certified Individual. The user of this Guide must ensure that the correct Inspector is identified;
- (b) the Certificate Holder designates an individual in the company as a prime liaison with the Inspector at the plant or field site, to apprise the Inspector of work progress, and to give notification in advance of approaching inspection or hold points as designated by the Inspector on the traveler, process sheet, or checklist;
- (c) a statement of granting free access to all parts of the plant or field site where Code activities are in process and to all documentation related to Code activities which the Inspector may require to perform required duties;
- (d) a current copy of the Quality System Manual provided for use by the Inspector in the plant or at the field site, including access to applicable procedures and work instruction;
- (e) reference of nonconformances found during Code fabrication involving repairs to pressure-retaining surfaces which require the user's (customer's) concurrence prior to repairs being performed;
- (f) reference for the Inspector's concurrence prior to repairs being performed for repairs to any pressure-retaining materials and final weldments to be made by welding; and
- (g) access granted in (c) above shall also apply to the Inspector Supervisor to perform annual National Board audits or additional periodic audits of the Manufacturer's Quality Management System and the performance of the Inspector. This is required by the National Board *Rules for Commissioned Inspectors*, NB-263, RCI-1. When in need of additional help, the Inspector may also request aid of the Inspector Supervisor responsible for the plant or site.

NOTE: This section of the Quality System Manual may reference superseded documents, such as the *National Board Bylaws*, or *National Board Rules and Regulations*. Any such references should be deleted or corrected.

2.16 Sample Forms

- (a) Controlling forms must be included in the Quality System Manual, identified by number or letter designation, and their use explained in the text of the Quality System Manual. They may be included with each section of the Quality System Manual or grouped together as an appendix. Under any condition, they are an integral part of the Quality System Manual and are subject to Inspector acceptance of changes.
- (b) Forms shown should be marked "SAMPLE" or "EXHIBIT." All forms used to control major functions of the fabrication, construction, repair or alteration processes should be

included. Welding documentation such as WPSs, PQRs, and WPQs need not be included, if available elsewhere. *Manufacturer's Data Report* forms and/or appropriate National Board Form "R" Reports (R-1, R-2, etc.) may be referred to, but not included as an exhibit or sample form.

- (c) Samples of "ACCEPT", "REJECT", and "HOLD" tags or stickers (if used) should be included with a notation of color, if actual tags are not shown as an exhibit.
- (d) Company internal procedures and instructions do not need to be included in the Quality System Manual, but if referred to in the text of the Quality System Manual, a short synopsis of their contents and the title of the individual responsible for their enforcement and use shall be provided to maintain continuity of the Quality Management System description.
- (e) The titles of control forms used in the text of the Quality System Manual shall be consistent with the titles of those shown as samples or exhibits.

2.17 Correction of Nonconformities

- (a) Has the Certificate Holder defined nonconformities? It must be provided for and explained. Usually, a deficiency is defined as either:
 - ASME: A nonconformity is any condition which does not comply with the applicable rules of the Division of the Code of Construction.
 - NBIC: A nonconformity is any condition that does not comply with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the Quality Management System.
- (b) Who is responsible for the resolution and disposition of nonconformities? Types of dispositions, i.e., repair, use as is (requires technical justification), etc. Who is responsible for assigning WPSs for welded repair?
- (c) What type of system is used to identify nonconformities, e.g., tags, nonconformance reports, nonconformance logs, etc.?
- (d) Is the Inspector consulted on the disposition of nonconformities? Is the Inspector given an opportunity to assign inspection or hold points for welded repairs?
- (e) Who is authorized to release items (remove tags) once the nonconformity is resolved?
- (f) How are examinations and inspections documented? Are records kept?
- (g) Do the controls provide assurance that a *Manufacturer's Data Report* will not be signed with open nonconformities?

2.17.1 Additional Requirements for Section VIII, Divisions 2 and 3

For Section VIII, Divisions 2 and 3 pressure vessels, are there provisions for reconciling nonconformities with the user that affect the *User's Design Specification*?

2.18 Record Retention

- (a) Distribution of the various *Manufacturer's Data Report*³ forms may have been explained

³ It must be noted by all concerned that the *Manufacturer's Data Report* is recognized as a controlling document and, as such, must be complete

in the examination and inspection section of the Quality System Manual. If not, it must be explained in a separate section. The *ASME Boiler and Pressure Vessel Code* sections vary in the responsibilities placed upon the Certificate Holder regarding retention and distribution of *Manufacturer's Data Reports*. As an example, Section I specifies distribution of the various types of *Manufacturer's Data Reports* but does not require retention of a copy by the boiler Manufacturer for 5 years, in accordance with PG-113.

- (b) Sections IV; VIII, Divisions 1, 2, and 3; X, and XII are specific in requirements for retention and distribution or National Board registration⁴ in lieu of retention of *Manufacturer's Data Report* forms. See footnote below of this Guide.
- (c) In actual practice, Manufacturers retain many, if not all, of the records generated during fabrication, repair, or alteration. The Code sections require that such documentation be made available to the Inspector during fabrication for certification of the *Manufacturer's Data Report*, upon completion of the boiler, pressure vessel, or part which will be Code Certification Mark stamped.
- (d) In addition to the foregoing, the Quality System Manual section for records retention should also explain the following:
 - (1) What fabrication and material records are maintained as a matter of company routine?
 - (2) How are National Board registration numbers controlled and assigned? Who is responsible for this function?

2.18.1 Additional Requirements for Section VIII, Division 1

- (a) Section VIII, Division 1 contains supplemental rules for record retention by the Manufacturer or Assembler and they shall have a system for the maintenance of radiographs (UW-51), *Manufacturer's Data Reports* (UG-120), and *Certificates of Compliance* (UG-120) as required by this Division.
- (b) The Manufacturer or Assembler shall maintain the documents outlined below for a period of at least 3 years:
 - (1) *Manufacturer's Partial Data Reports*
 - (2) Manufacturing drawings and design calculations, including any proof tests reports
 - (3) *Material Test Reports* and/or material certifications
 - (4) Pressure parts documentation and certifications
 - (5) Welding Procedure Specifications and Procedure Qualification Records
 - (6) Welder/Welding Operator Performance Qualification Records for each welder who welded on the vessel

and correct, with the original copy signed by both the Certificate Holder and the Inspector.

⁴ Boilers and pressure vessels may be registered with the National Board, in which case the original *Manufacturer's Data Report* shall be sent to The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229-1183. Manufacturers that register with the National Board may retrieve their company's *Manufacturer Data Reports*, for their use, without charge. Chiefs or directors of Jurisdictions may also obtain copies without charge. Registration of *Manufacturer Data Reports* with the National Board ensures permanent documentation and accessibility for repairs and for the movement of vessels across jurisdictional boundaries.

- (7) RT and UT reports
 - (8) Repair procedure and records
 - (9) Process control sheets
 - (10) Heat treatment records and test results
 - (11) Postweld heat treatment records
 - (12) Nonconformance and dispositions
 - (13) Hydrostatic test records
 - (14) Transfer forms [see UG-120(c)(1)(-e)]
- (c) For Manufacturers of “UM” stamped vessels or vessels constructed under the provisions of UG-90(c)(2) rules, the records listed in (b) above, for six representative vessels per year, shall be maintained as follows:
- (1) “UM” stamped vessels for a period of 1 year
 - (2) vessels constructed under the provisions of UG-90(c)(2) rules for a period of 3 years

Who is responsible for completing and signing the Certificate of Compliance, Form U-3 or U-3A, for each pressure vessel marked with the Certification Mark with the “UM” Designator?

Who is responsible to ensure the “UM” Certificates of Compliance will be retained on file for a minimum of 5 years?

In lieu of keeping the “UM” Certificate of Compliance on file for 5 years, the vessel may be registered, and the *Manufacturer’s Data Report* filed with The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229.

2.18.2 Additional Requirements for Section VIII, Division 2

- (a) The *Manufacturer’s Data Report*, with applicable *Manufacturer’s Partial Data Reports* and *Supplementary Sheets* attached, shall be maintained in a safe repository by the Manufacturer for at least 3 years, or the vessel may carry a National Board registration number on the ASME Code nameplate and *Manufacturer’s Data Reports*, with attachments, and be registered with the National Board, per 2.C.1.3 of Section VIII, Division 2.
- (b) The certified User’s Design Specification and a copy of the certified *Manufacturer’s Design Report* shall be retained on file by the Manufacturer, per 2.C.3 of Section VIII, Division 2. In addition, the Manufacturer of a vessel or part shall maintain a file of all material certifications and/or *Partial Manufacturer’s Data Reports*, examination procedures, test procedures, heat treatment procedures and reports, manufacturing procedures, specifications and drawings used.
- (c) All records shall be fully identified and shall also include records of repairs to materials and items, per 2.C.3 of Section VIII, Division 2. The records listed in

this paragraph shall be maintained by the Manufacturer in storage facilities, providing suitable protection from deterioration and damage, for a period of three years. After said period, the Manufacturer may either continue maintenance of the records or offer the records to the vessel user, and if a rejection is received, the records may be destroyed.

2.18.3 Additional Requirements for Section VIII, Division 3

- (a) All records listed in KS-320 and a complete set of radiographs for each vessel or vessel part shall be retained by the Manufacturer for 5 years.
- (b) The Manufacturer shall furnish to the user the records listed in KS-320.

2.18.4 Additional Requirements for Section X, Fiber-Reinforced Plastic Vessels

- (a) Record retention for Section X is divided for records for Class I and Class II vessels. Each category of records is considered part of the Fabricator's Design Report. For Class I, the *Fabricator's Design Report* shall be maintained for 5 years, and for Class II vessels, it shall be retained for 10 years. Both classifications will be on file in a safe depository acceptable to the user. (RG-321.1, RG-321.2)
 - (1) Who is responsible for collecting records and compiling records for the *Fabricator's Design Report*?
 - (2) Are the records indexed for easy access?
 - (3) Who is authorized to access to the *Fabricator's Design Report* and supporting records?
 - (4) Is correction of the *Fabricator's Design Report* permitted? If permissible, how is it performed?
 - (5) Are there provisions for access by the Inspector to the *Fabrication Design Specification* and supporting records?
- (b) The records required for the *Fabricator's Design Report* are listed as follows:
 - (1) Class I Fiber-Reinforced Plastic Pressure Vessels
 - a. Design Specification;
 - b. Design Report;
 - c. Design calculations;
 - d. Material Manufacturer's specification sheets for resin, fiber reinforcement, promoters, catalysts, and other components used in the laminate construction;
 - e. Properly certified RP-2 form;

- f. Procedure Specification;
 - g. Qualification Test Reports;
 - h. Quality Control Test Report; and
 - i. Production Test Report.
- (2) Class II Fiber-Reinforced Plastic Pressure Vessels
- a. Design specification;
 - b. Design drawings;
 - c. Design calculations;
 - d. Material Manufacturer's specification sheets for all materials used in lamina testing and laminate fabrication;
 - e. Properly certified RP-4 form;
 - f. Procedure specification;
 - g. Acceptance test results; and
 - h. Documentation of the elastic and strength properties of the lamina(s), as specified and determined in Article RT-7, to be designated as the Material Test Report.

2.19 Glossary of Terms

A glossary of terms is desirable for clarity if abbreviated titles of personnel and control documents are used throughout the manual. This is not a mandatory inclusion.

2.20 Audits

Management audits of the Quality Management System are not a specific requirement of the ASME Code Sections I; IV; VIII, Divisions 1, 2 and 3; and Section XII. Self-Audits are required by Section X. Many Certificate Holders elect to use a management audit system as a good means of judging the effectiveness of the system in use.

2.21 Registration with the National Board

- (a) When a Manufacturer/Installer or Fabricator/Assembler registers boilers, pressure vessels, and other pressure-retaining items with the National Board, the Quality System Manual shall make provisions for the control of the National Board registration numbers. The Quality System Manual shall, therefore, contain a statement such as:

“National Board registration numbers shall be controlled and issued by the Quality Control Manager, who shall maintain a record showing National Board registration number, Manufacturer's serial number, and date of issue. The Quality Control Manager shall submit to the National Board, within 30 days, the original *Manufacturer's Data Report* required for the pressure-retaining items stamped with the ASME Certification Mark.”

- (b) It is highly recommended that all Manufacturers register all *Manufacturer's Data Reports*

with the National Board for any item to which an ASME Certification Mark is applied.

- (c) National Board registers boilers, pressure vessels, and other pressure-retaining items completed and stamped with the ASME Certification Mark and appropriate designator.
- (d) The National Board Authorized Inspector Commission number and endorsement shall be shown after the Inspector's signature on *Manufacturer's Data Reports* or *Manufacturer's Partial Data Reports*. If registered, the boiler, pressure vessel, or other pressure-retaining item's National Board registration number must be identified on the Code stamping or nameplate.

3.0 Review of Shop and Field Sites

- (a) After review of the company's written description of operations, as explained in the Quality System Manual, both the Team Leader and the accredited Authorized Inspection Agency representative should have a sound understanding of how the company produces, or intends to produce, Code items.
- (b) A meeting with company personnel at the plant or field sites affords the Review Team an opportunity to see the type of products produced or work performed, and to evaluate whether the system described is being implemented throughout the plant or field site.
- (c) A brief conversation with the Inspector assigned to the plant or field site is often helpful, especially if this meeting can be arranged prior to meeting with company personnel. The Inspector often gives insight into company operations that will be helpful during the Review process, and in the initial meeting with the company's personnel. Likewise, the Review Team members may find areas in which they can aid the Inspector in performing Code duties.

3.1 Initial Meeting with Company Personnel

- (a) A brief opening meeting affords company management personnel, Review Team members, and jurisdictional personnel (if in attendance) an opportunity to get acquainted. It is also the time to obtain answers regarding company operations not clearly understood during the Manual Review.
- (b) The ASME and/or National Board application form must be reviewed to ascertain whether Certificates and Code symbol stamps applied for fulfill the company's need for its intended (or continuing) Code operations.
- (c) The Team Leader must explain affiliation of the Review Team members, and the important role of the Inspector should be covered. The role of the Jurisdictional Authorities and jurisdictional laws and regulations under which the Code obtains legal status must be comprehended by all parties.
- (d) The purpose of the Review and the Team's responsibility must be made clear regarding submission of reports of findings to the ASME Subcommittee on Boiler and Pressure Vessel Accreditation and the National Board.
- (e) In the case of new Applicants, the role of the Inspector and Inspector Supervisor must be understood. This should also draw management attention to the significant importance of their own quality control personnel under an ASME and/or National Board Code program.
- (f) A short explanation of the Review Team's intended agenda should be made.⁵ Assurances

⁵ In agenda planning, meals and breaks are to be kept to a minimum. Review activities are to be performed in a meaningful and expeditious manner.

should be given to management that a verbal report of findings and distribution of the QA, and as applicable the QB, and QC Forms of the ASME *Qualification Review Report* (QRR) and the National Board QRR will be presented at the exit meeting with the Certificate Holder by the Team Leader.

- (g) Management personnel should have the opportunity to introduce their team and bring up any questions they may have prior to the conclusion of the meeting.
- (h) List numbers and expiration dates of ASME Certificates currently held, if any.
- (i) If current Certificates are held, ensure the company name and address is correctly shown thereon. Any deviations must be investigated by the Team Leader and explained on the *Qualification Review Report*.
- (j) The Team Leader will also inform the Applicant that the Review is conducted in strict confidence, of their right to due process and to contact (in writing) ASME Accreditation Subcommittee of Boilers and Pressure Vessels or the National Board, as applicable, concerning appeals of any disagreement with the Team's conduct, findings and recommendations.

3.2 Quality Management System Critique

- (a) The *ASME Boiler and Pressure Vessel Code* sections and the NBIC require a Certificate Holder to provide a written description of the system in use to meet the requirements of the Code section(s) used for fabrication or NBIC as applicable. The Quality Management System in use to achieve Code compliance should be one that is suitable for the circumstances applicable to the scope of the acceptance that is outlined in the Applicants written Quality System. During the review of the written description, it must be ensured that all the controls and requirements specified by the applicable Code sections are described for the types of products produced or repaired, and that responsibilities for achieving the requirements are assigned to personnel in the Certificate Holder's organization, or if applicable, to the subcontractors responsible to the Certificate Holder. The system should be described in a manner that renders it auditable.
- (b) Some additions may be required to cover Code responsibilities. Others may be suggested to achieve clarity and better describe the system found in use. The Quality Management System additions and changes should be kept to a minimum, as necessary to achieve these results.
- (c) The critique of the contents of the Quality System Manual is normally accomplished in a meeting with the Review Team members and representatives of the quality control department personnel responsible for the contents and enforcement of the Quality Management System. Required additions to the Quality System Manual can be made to ensure that Code specifications provided for can be justified by reference to applicable Code section(s) paragraphs.
- (d) On occasion, the implementation may reveal some variations from what is described in the written Quality System. Should this happen, the Applicant must revise the written Quality System to describe how the quality functions are carried out.
- (e) Regardless of the circumstances, the system described in the text of the Quality System Manual and the documents shown as exhibits or samples shall be those found in use in the plant or at the field site.

3.3 The Implementation Review

The starting point and the order in which various functions are reviewed is a choice of the Review Team and company personnel. The scope of the Review and areas of particular interest will vary with the products.

3.4 Availability of Code Sections

In all offices and shop areas visited, a spot check should be made of the Code sections available for reference purposes. Some companies maintain a library, centrally located, where these documents are available. The Certificate Holder or Applicant must have the required current Editions and divisions of the Code sections on hand, that are required for the product they are manufacturing or fabricating and/or NBIC as applicable (see 5.0 of this Guide). It is recommended that the organization maintain previous Codes and addenda for those Codes used to justify procedures, i.e., Sections V and IX.

3.5 Engineering and Design

- (a) If Code work is accomplished to customer supplied drawings and calculations, does the Certificate Holder review the drawings and calculations furnished to ensure Code conformance, and who is responsible for this activity?
- (b) Does the company prepare drawings and/or calculations if not supplied by the customer? A spot review of Code calculations may be advisable. Some calculations are incomplete and can be a source of Code deviations in such areas as material thicknesses, allowable pressures, reinforcement of nozzles, etc. For Section I of the ASME Code and the NBIC, it is required that the Inspector review a selected number of calculations to verify compliance, with applicable Codes.
- (c) Is distribution of drawings (shop prints) described? Are the latest applicable revisions provided? Is disposal of superseded documents controlled?
- (d) For Section VIII, Division 1, is the User's Design Report Form or equivalent required due to a UG-22 loading, see U-2 (a)(2).
- (e) For Section VIII, Divisions 2 and 3, are the User's Design Specification and *Manufacturer's Design Report* understood and provided for per Code requirements?
- (f) How are Code materials specified?
- (g) What information is contained in the drawings or shop prints with respect to welding, NDE, materials, pressure tests, Code Edition and addenda, and minimum design metal temperature, if applicable, or are these specified elsewhere? How are these documents controlled?
- (h) For NBIC repairs, how are the existing materials identified?

3.6 Purchasing Functions

- (a) How is purchasing informed of materials to procure i.e., material requisitions, bill of materials, or other means? Are *Material Test Reports*, heat treatment, NDE, and other requirements specified by the purchase order?
- (b) What quality control and engineering input is provided?
- (c) Is the purchase order traceable to the applicable job order number or material certifications?

- (d) For cold-formed steel products by a subcontractor, are the requirements of UG-79 of Section VIII, Division 1 included in the purchase order and certification checked upon receipt? If not, are requirements checked in-plant to see if heat treatment of formed pressure-retaining parts is required and accomplished?
- (e) For cold-formed austenitic materials for Section I, PG-19 requirements, it is recommended that the percent of strain be determined prior to purchasing the item. Should supplement heat treatment be required, it should be specified in the purchase order or defined in the Quality System Manual.

3.7 Receiving of Materials and Parts

- (a) Who receives materials and parts? What quality control input is provided? Is there a copy of the purchase order at the receiving inspection area?
- (b) How are materials and parts inspected and checked upon receipt? What system of markings (stickers, tags, dye marking) is used for traceability and identification?
- (c) Are *Material Test Reports* or *Certificates of Compliance* traceable to the purchase order and/or job order? Who checks *Material Test Reports* for compliance to Material Specifications, as required by Section II of the ASME Code? Who checks other material documentation?
- (d) How is nonconforming material(s) handled? Who decides?
- (e) Are *Manufacturer's Partial Data Reports* required and obtained for parts fabricated by welding, including those parts having the Certification Mark and PRT Designator?
- (f) Is the program found in use as described?
- (g) Are the requirements of PG-10 and PG-11, UG-10 and UG-11, or TM-120 and TM-130 used? Are the controls adequate?

3.8 Demonstration Items

- (a) The system described in the Quality System Manual must be demonstrated. If Code work is in progress at the time of Review, it shall be used for the demonstration. If the in-progress work does not demonstrate all elements of the Quality System, or no Code work is in progress, the system does not have to be demonstrated on Code work. Non-Code fabrication may be used, provided it is representative of the Code work contemplated, is documented throughout as a Code item, and is covered by the scope of the program.
- (b) Are plant facilities and the equipment adequate for the type of Code work the Applicant specified in the Scope of their written Quality System, or are subcontracting facilities available for these functions?
- (c) Verify that travelers, process sheets, or checklists used are to document Code activities. Are travelers, process sheets, or checklists appropriate for the work being performed? Do travelers, process sheets, or checklists contain steps necessary to ensure required examinations and inspections by quality control personnel and the Inspector? Is space provided for sign-off and date as these activities are completed?
- (d) Are fit-up, forming of shells, and welding within an acceptable tolerance?
- (e) How are production welds identified to the welder or welding operator (stamps, weld

maps, etc.)?

- (f) Are copies of Welding Procedure Specifications or other specific instructions available to the welder or welding operator in the work area?
- (g) How are tack welds treated? Are they prepared prior to inclusion in the weldment, or are they removed? Are tack welds visually examined for defects, and if found defective, are they removed? If incorporated in the weldment, are approved welding procedures and qualified welders used?
- (h) Who is responsible for instructing, supervising, and assigning welders and welding operators?
- (i) Are material identification markings visible and identifiable on pressure-retaining parts, or are there other means provided for material traceability?
- (j) Is the system demonstrated, including documentation, as described?
- (k) Are welded joints in production clean and free of scale, rust, oil, etc.?

3.9 Welding Control

- (a) A review should be made of the Welding Procedure Specification (WPS), Procedure Qualification Record (PQR), Welder Performance Qualification Record (WPQ), and Welding Operator Performance Qualification (WOPQ).
 - (1) The latter three records must be certified and dated by a member of the company as required by Section IX of the Code, plus the various other Code sections, if required by the Quality System Manual.
 - (2) A record of welder's and welding operator's qualifications in various processes (welder's log) should also be maintained to ensure continuing qualifications.
- (b) Are welding procedures being used within their ranges for production welds? Are the welders, welding operators, brazers, and brazing operators welding or brazing within their qualification ranges?
- (c) Are minimums, maximums, or ranges established on the Welding Procedure Specifications and welder's and/or welding operator's performance qualifications for the applicable variables required by Section IX of the Code?
- (d) Are issue and return of covered electrodes, such as low hydrogen or stainless steel electrodes, controlled as described in the program? Who is responsible?
- (e) Are heated ovens provided for covered electrodes, such as low hydrogen, or stainless steel following removal from their sealed containers? Are covered electrodes, such as low hydrogen, or stainless steel electrodes in holding ovens maintained at temperatures recommended by the electrode Manufacturer, or Part C of Section II of the ASME Code? How are these electrodes protected from moisture absorption when used in the shop or at the field sites?
- (f) Are welding material Manufacturer's markings maintained on spools of bare welding wire in the issue room and in the shop or field?
- (g) Are welding materials marked with SFA or AWS designations? All covered electrodes must have electrode classification stenciled on the stub end of the electrode covering.

Filler metal wire traceability to the filler metal certification must be maintained.

- (h) Are tack welds, aligning lugs, brackets, and attachments to pressure-retaining materials controlled? Is a WPS assigned to each of these areas? Are qualified welders assigned?
- (i) Is there a system available to inform the person who assigns welders that the welder's qualifications have been maintained for each welding process and the welder is qualified for the position, progression, with or without backing, electrode diameter, thickness range, base metal thickness range, material specification, and the electrodes to be used in production?

3.10 Nondestructive Examination (Not Applicable to Section IV)

- (a) A review should be made of NDE Written Practice and personnel qualification records. This applies equally to company in-house procedures and personnel records and those of a subcontracted facility.
- (b) Personnel qualifications for radiographic (RT) and ultrasonic (UT) examiners must comply with the Employer's Written Practices.
- (c) Documentation for various levels of proficiency regarding general, specific, and practical examinations and training are also listed.
- (d) Certification records for NDE personnel and their required contents are shown in Article 1, T-190.
- (e) For visual (VT) examiners of piping components, as required by ASME B 31.1, does the visual inspector's Employer certify the examiners in accordance with the requirements? Is the VT examiner certified in accordance with AWS QC-1, or SNT-TC-1A? Is the VT examiner required to have an annual eye examination? Are VT examiners performing visual examinations to ASME B31.1? Even though B31.1 does not require a written procedure for VT examinations, it is strongly recommended that a written procedure be used.
- (f) The Level III examiner may be qualified by examination or appointment, without examination. He may be an employee of the Certificate Holder or of a subcontractor. If the latter, documented evidence must be on file accepting the subcontractor's Level III examiner as the Certificate Holder's Level III examiner.
- (g) Magnetic particle (MT), liquid penetrant (PT), and VT examiners may be certified by the Certificate Holder based on proficiency in the techniques employed, plus an annual eye examination.
- (h) Are written procedures (UT, MT, PT, and VT) or technique sheets (shooting sketches) for RT available to the examiner and the Inspector?
- (i) Is adequate equipment for film viewing available to the Inspector? Are interpretation sheets provided to the Inspector along with the RT film?
- (j) Is a densitometer or step-wedge film strip available for density comparison, and is the densitometer and step-wedge calibrated as required by Section V of the Code?

3.11 Heat Treatment (Not Applicable to Section IV)

- (a) If heat treatment is used or if subcontracted, the Quality Management System should provide adequate controls (see 4.12 of this Guide).

- (b) If in-plant or portable field-site equipment is used, a review should be made of the type of equipment, capacities, whether contact-type thermocouples are used, plus calibration and servicing of recording devices and other records maintained.
- (c) Are written heat treatment procedures or heat treatment instructions provided to the operator of the heat treatment equipment?
- (d) If subcontracted, are measures provided to ensure proper performance and calibration, as well as proper records of heat treatment, such as dated heat treatment recorder strips, or dial-type heat treatment equipment charts, purchase orders, or job order identification?
- (e) How are materials, parts, or vessels sent out of the plant for subcontracted heat treatment; and how are they inspected when returned from the heat treatment subcontractor? Are records maintained, particularly of material and parts identification?
- (f) Are records made available to the Inspector for review of Code compliance?

3.12 Calibration

- (a) Who is responsible for calibration activities? Who accomplishes calibration requirements?
- (b) What is the method used for recordkeeping? Are cards or labels used? Is measurement and test equipment under the calibration program?
- (c) Is the calibration program controlled as described in the Quality System Manual?
- (d) Is measurement and test equipment identified?

3.13 Record Retention

- (a) A review of recent Code job files can be very informative for Certificate renewal Reviews. The traveler, process sheet, or checklists can provide insight into the quality control department and Inspector's activities. A random check of *Manufacturer's Data Reports* and/or Repair Report Forms and other documents in selected files may be accomplished. In the case of Section VIII, Division 2 requirements, the Code-required documentation in 4.14.2 of this Guide should be checked for completeness and for adequate protection from deterioration and damage.
- (b) Are rubbings of nameplates or stampings maintained? This is not a Code requirement, but is good practice followed by many companies. If maintained, they should be checked for compliance with the applicable Code section and divisions, as a minimum, that acceptable data is being maintained. Records of National Board registration numbers should be checked and National Board advised of the numbers used, and the date when they were issued. If it is determined by the National Board representative that the Inspector is not satisfying the *Rules for Commissioned Inspectors* (NB-263 RCI-1), the National Board must be advised in writing.

3.14 Review of Program Additions and Changes

- (a) A review of any additions or changes to the Quality System Manual, agreed upon by all parties, should be made during this Review and so noted in the Team Leader's report to ASME and/or the National Board. Following achievement of an acceptable program, all copies, except those which may be required by the authorized agency personnel or

Jurisdictional Authority⁶, must be returned to the company.

- (b) Any company forms or documents collected during the Review must also be returned to company custody. The only exception would be documents needed as attachments or exhibits to accompany the Team Leader's report to ASME and/or the National Board.
- (c) For preparation of required reports to ASME and/or the National Board, see 3.0 of this Guide. An agreement should be reached by the Team (without company personnel present) concerning the oral report to be made to management. The ASME *Qualification Review Report* shall be completed and certified at this time by the Review Team members.
- (d) The general contents of the *Qualification Review Report* to SC/BPVA and/or the National Board should also be discussed and agreed upon. (See 4.0 of this Guide.)

3.15 Exit Report to Management

- (a) An oral report of findings by the Review Team is made by the Team Leader to the management of the company, including any personnel that management may wish to have present. This report should be a synopsis of findings that might call for management attention, as well as the recommendation to ASME accreditation authorities and/or the National Board, regarding granting or renewal of *Certificate(s) of Authorization*.
- (b) It must be stressed that the responsibility of the Review Team is to report conditions as found and recommend actions to be taken on granting or renewing *Certificate(s) of Authorization*. Final action of these matters is a prerogative of the ASME and/or the National Board accreditation authorities, not the Review Team.
- (c) A copy of the Quality Review Report form(s), as applicable, shall be made available to the Certificate Holder after conclusion of the oral report. The form shall indicate the Team's recommendation, and the date and signature of the Team Leader.
- (d) Appreciation should be expressed to management of the company for cooperation and courtesies extended to the Team by company personnel.
- (e) Opportunity for any questions should be afforded at this time.
- (f) Opportunity for the Manufacturer to express any complaints concerning the Team's findings, recommendations, or conduct of the Review should be afforded.
- (g) After completion of the above listed items, the Review can be concluded.

4.0 Forms and Reports

4.1 Qualification Review Report

- (a) Recommendation and findings are as follows:
 - (1) Upon completion of the Review, the Team Leader and the Authorized Inspection Agency representative will discuss their findings and reach an agreement on the recommendation to be forwarded to the ASME accreditation department and the National Board, as appropriate. The *Qualification Review Report(s)* will be completed by the Team Leader and Team Members will sign, except as provided for under certain circumstances covered in paragraph 4.1 (b) of this section.

⁶ Jurisdictional Authorities have the option of retaining copies of any document they wish.

Jurisdictional representatives are welcomed and encouraged to participate in Joint Reviews held within their jurisdictional area. If a jurisdictional representative has actively participated in the Review, his recommendation will be given equal consideration and he will be invited to sign the qualification report, along with the other Team Members.

- (2) Where the Jurisdiction is the accredited inspection agency, the jurisdictional representative becomes the second party in the Review and signs the ASME *Qualification Review Report* as the Authorized Inspection Agency.
- (b) If an agreement on findings cannot be reached between the Team Members, the Team Leader will complete the *Qualification Review Report* and sign it. The dissenting party or parties will be requested to sign the report under Team Members, but not to initial the recommendation portion of the report. Furthermore, the dissenting party or parties must identify on the *Qualification Review Report* that a minority report will be submitted to ASME and/or the National Board, as appropriate.

4.2 Reports

- (a) ASME and the National Board require specific forms and/or reports to be used in documenting the activities of the Review.
- (b) These forms and/or reports must be completed and submitted in accordance with the rules of the applicable accreditation body. It is essential that the Team Leader understand and comply with the current requirements of the applicable accreditation body.
- (c) If a dissenting opinion is expressed by the Authorized Inspection Agency representative or the jurisdictional representative (if present), this will be so noted in the *Qualification Review Report*.

5.0 Code Books Required by Certificate Holders

5.1 ASME Code Sections Required by Certificate Holders

The current Edition of the *ASME Boiler and Pressure Vessel Code* plus applicable addenda must be held by Applicants for *Certificates of Authorization* and holders of such Certificates, dependent upon the type(s) of Code symbol stamp(s) applied for. The link below provides the listing of required standards for use with the ASME Product Certification Programs.

<https://www.asme.org/certification-accreditation/asme-certification-process/required-code-books>

5.2 National Board Code Books Required by Certificate Holders

The Applicant shall have the latest mandatory Edition of the NBIC, all parts, and shall have available the Code of Construction Edition/addenda, including any applicable referenced standards for materials, welding, and nondestructive examination required for performing the repair or alteration activity. The link below is provided to order the NBIC.

<https://www.nationalboard.org/securelogin.aspx?returnurl=ordernbic2021.aspx>

6.0 Code References for Reviews

The following compilation of Code section reference follows the general format of this Guide, as set forth in Section 2.0, but differs in numbering of paragraphs and, in some cases, subject matter. This list of references may not be all inclusive or current. Refer to the current Edition of the applicable *ASME Boiler and Pressure Vessel Code* and/or the NBIC as applicable.

6.1 The Manual Review

NBIC	Section I	Section IV	Section VIII Division 1	Section VIII Division 2	Section VIII Division 3	Section XII All Classes
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6.1.1 Statement of Authority

Part 3, 1.5.1 d)	App. A-302.1	App. F-202.1	App. 10-3	Annex 2.E.3	App. 2-111 App. 4-400	App. I-3
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6.1.2 Organization

Part 3, 1.5.1 f)	App. A-302.2	App. F-202.2	App. 10-4	Annex 2.E.4	App. 2-112 App. 4-400	App. I-4
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6.1.3 Quality Control Authority and Responsibility

(a) Preparation, revision, distribution and implementation of the Quality System Manual.

Part 3, 1.5.1 e)	App. A-301.1 PG-105.4 CA-1, 2.2	App. F-100.1 HG-540.4 CA-1 Note 16	App. 10-1 App. 10-3 U-2(b) UG-117(e)	Annex 2.E.1.1 2.3.6	App. 2-100 App. 2-111 App. 4-400	App. I-1 App. I-3 TG-320
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(b) Revisions to the Quality System Manual should reference how the Quality System Manual, including exhibits, is revised, i.e., page, paragraph, etc. The revision system must include exhibits or samples.

Part 3, 1.5.1 e)	App. A-302.12 PG-90.1.2 PG-105.4	App. F-100.1 App. F-202.9 HG-540.4 CA-1 Note 16	App. 10-1 App. 10-14 App. 10-15 U-2 UG-117(e)	Annex 2.E	App. 2	App. I-1 App. I-15 TG-320 TS-200.4 TS-200.5
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(c) Revisions to the Quality System Manual are to be acceptable to the Authorized Inspector.

Part 3, 1.5.1 e)	PG-90.1.2	App. F-100.1 HG-540.6 CA-1 Note 16	U-2 UG-117(f)	Annex 2.E.1.1	App. 2-100 App. 2-123 KG-433 KS-250(f)	App. I-1 TS-200.5(f)
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(d) Revisions to the Manufacturer's Quality System Manual must be acceptable to ASME, when the scope of the Manufacturer's *Certificate of Authorization* is for Class 3 Transport Tanks.

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(e) Provisions for a copy of the Quality System Manual to be available for use of the Authorized Inspector.

Part 3, 1.5.1 e)	App. A-302.13.2.1 PEB-18.5.1(b) PG-73.7.1(2) (for CI)	App. F-202.10.2.1	App. 10-15 UG-117	Annex 2.E.15.3	App. 2-123(c) App. 2-124 KG-433	App. I-16
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(f) Control of the Code Certification Mark.

Part 3, 1.42	PG-104 PG-105 PG-106 PG-107 PG-108 PG-109 PG-111	HG-530 HG-531 HG-532.3 HG-533.4 HG-540.1 HG-540.8 HLW-602 CA-1 Note 16	U-2 UG-90 UG-116 UG-117	Annex 2.G.2.3	KS-240 KS-250	TS-120
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(g) Examinations and tests by the Manufacturer.

(1) General:

Part 1, 5.4	App. 302.5	App. F	App. 10-7	Annex 2.E Part 7	App. 2-115	App. I-7 TT-100 TT-200
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(2) During Fabrication:

—	PW-1 PW-46	Part HG, Article 5 Part HLW, Article 5	UG-95 UG-96 UG-97	Part 6	App. 2-123	Part TE Part TT
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NBIC	Section I	Section IV	Section VIII Division 1	Section VIII Division 2	Section VIII Division 3	Section XII All Classes
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(3) PT or MT:

Part 2, 4.2.2	PG-25	NA	App. 5-5	7.5.6	KE-103	TE-110.4
Part 2, 4.2.3	PG-93		App. 6	7.5.7	KE-104	TE-110.5
Part 3, 2.5.3 e)	A-260		App. 7-2	3.3.5	KE-211	TE-240
Part 3, 3.3.4	A-270		App. 8	3.6.4	KE-212.1	App. V
	ASME B31.1 (BEP)		App. 20-3	3.7.2	KE-212.4	App. VI
	102.4.6		App. 22-4	3.8.2	KE-213	
	136.4.4		UCI-78	3.8.3	KE-221(c)	
			UCS-56	3.9.3	KE-230(a)	
			UCS-68	3.11.2.9	KE-231(c)	
			UF-31	4.16.4	KE-233	
			UF-36	Table 5.12	KE-241(b)	
			UF-37	6.1.1.3	KE-241(c)	
			UHT-57	6.1.2.9	KE-251(a)	
			UHT-83	6.1.3	KE-252(c)	
			UHT-85	6.1.4	KE-261	
			ULW-52	6.2.4.3	KE-263	
			ULW-56	6.2.4.8	KE-300(b)	
			UW-34	6.2.4.9	KE-300(c)	
			UW-42	6.4.5.2(e) & (g)	KE-310	
				6.4.6.4	KE-322	
				6.6.5.6	KE-324	
				6.7.6.3	KE-325	
				6.7.7	KE-334	
				7.4.3		
				7.4.5		
				7.4.7		
				7.4.8.2		
				7.4.9.3		
				7.4.9.4		
				7.4.10.2		
				7.4.11.7		
				7.4.11.8		
				7.4.11.9		
				7.4.12		
				7.5.5		

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(4) UT or RT:

Part 2, 4.2.4 Part 2, 4.2.5 Part 3, 2.5.3 e) Part 3, 3.3.4.2 g) Part 3, 3.3.4.3 e)	PW-11 A-250 ASME B31.1 (BEP) 102.4.3 136.4.5	NA	App. 12 UCI-78 UCL-35 UCS-57 UF-37 UF-5 UF-55 UHA-21 UHA-33 ULT-57 ULW-52 ULW-53 ULW-57 UNF-57 UW-11 UW-2 UW-34 UW-42 UW-51 UW-52 UW-53	7.5.3 7.5.4 7.5.5 3.3.3 3.3.4 3.3.4.5 3.3.6.2 3.3.7 3.6.2 3.6.3 3.7.3 3.8.2 3.8.3 3.9.3 6.1.3 6.7.2 7.4.3 7.4.4 7.4.8 7.4.9 7.4.10 7.4.11 7.4.12 4.16.4 6.2.4 6.2.5	KE-101 KE-102 KE-212.4 KE-221(a) KE-221(b) KE-222 KE-230(a) KE-231(a) KE-231(b) KE-232.1 KE-232.2 KE-241(a) KE-242 KE-243 KE-251(a) KE-251(b) KE-252 KE-264 KE-265 KE-300(a) KE-322 KE-323 KE-332 KE-333	TE-110.2 TE-110.3 TE-230 App. IX
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(5) Visual:

Part 3, 3.3.2 e) Part 3, 4.4.1 e) Part 3, 4.4.2 c)	PB-49 PW-28.1.2 PW-31.3 PW-35.4 PR-25 ASME B31.1 (BEP) 136.4.2	HB-1503 HW-731.2 HW-731.3(b)	UB-44	7.5.2 7.6 3.7.2 3.8.3 4.9.4 Table 5.12 6.1.4 6.2.5.5 6.2.7 7.4	KE-262	TE-200(a) TP-410.1 TT-210(a)(5) TT-210(b)(6)
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(6) Hydrostatic Testing:

Part 3, 4.4.1 a) Part 3, 4.4.2 a)	PEB-17.1 PG-99 PMB-21 PL-3	HA-406 HC-410 HG-510 HLW-505	UG-99	8.2 4.1.6.2 7-A.3.2.7	KE-400 KE-410 KT-300 KT-311 KT-312 KT-312.3 KT-320 KT-330 KT-340	TT-210(a)
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(7) Pneumatic Testing:

Part 3, 4.4.1 b) Part 3, 4.4.2 b)	_____	HF-204.1(e) HG-510 HG-511 HW-745 HA-407	UG-100	8.3	_____	TT-210(b)
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(8) Proof Testing:

_____	App. A-22 PG-18	HA-400 HC-400 HG-500 HLW-502	UG-101	_____	_____	TT-3
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(9) Impact Testing:

_____	_____	_____	U-3 UCS-66 UCS-67 UCS-68 UF-5 UG-20(f) UG-84 UG-90(b)(7) UHA-51 UHT-6 ULT-5	3.11	Article KT-2 KM-212 KM-213 KM-230 thru 234	TM-210 TM-220 TM-230 TM-240 TM-250 TM-260
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6.1.4 Drawings, Calculations, and Specifications

- (a) Review for Code compliance, purchaser and Certification Mark Holder’s supplied documents that provide necessary information. For Section XII, information must include modal application and service conditions, including the hazardous material being transferred.

- (1) Units (US Customary or SI Metric):

Part 1, 7.1 Part 2, 7.1 Part 3, 7.1	App. A-391 App. A-392 App. A-393 App. II PG-4 PG-23.3	App. M	App. 33 App. GG U-4 UG-23(a) UG-115(b)	Annex 2.E.5 1.4	App. 2-113 App. 2-123 KG-311.12 KM-400	App. G App. I-5 TG-310 TG-310.1 TG-320 TG-140
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- (2) Preparation & Acceptance Calculations and Drawings:

Part 3, 1.5.1 g) Part 3, 1.5.1 o) Part 3, 3.2.4 Part 3, 3.2.5	App. A-302.13.2.2 App. A-317 PB-17 PG-16 PG-23 PG-27 thru 56 PG-58.3.1 PG-90.1.4 PG-90.3	App. F-202.3 HG, Article 3 HG-515.2 (b)	App. 10-5 App. 10-15 U-2(b)(1) U-2(c) UG-90(c)(1)(b)	Annex 2.E.5 2.3.3	App. 2-113 KG-323	App. I-5 TD-100 TD-140 TD-150 TD-160 TD-200 TD-210 TG-320
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- (3) Design Loadings:

Part 3, 1.2 d) Part 3, 3.3.3 b) Part 3, 3.4.2 a) Part 3, 3.4.3 h)	PFT-18 thru 20 PG-22 PG-32 PG-99.1 PW-43 ASME B31.1(BEP) 101.1 101.5 103 104 122	App. F-202.3 HG-501(a)	App. H UG-12 UG-20 UG-22 UG-23 UG-35.2(c)(3) UG-45(c) UG-54 UG-98 UG-99	Annex 2.E.5 2.3.3 4.4.12 5.1.3 5.5 Table 5.1 4.1.1.1 4.1.1.2	App. 2-113 KD-110 KG-311.2(d) KG-311.8	TD-200 TD-300.4 TD-400.7
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(4) Control of documentation:

Part 3, 1.5.1 e)	App. A-302.4 App. A-302.13.2.2 App. A-302.14.2.1 App. A-314 PEB-3.3 PFH-1.4 PG-10 PG-58.3.1 PG-90.1.12 PG-105.4 PG-112 PG-113 PHRSG	App. F-202.3	App. 10-5 App. 10-13 App. 10-15 UG-10 UG-85 UG-90 UG-93 UG-117 UG-130 UG-136 UHX-19.3	Annex 2.E.5 2.3.4 2.3.5 2.3.3	App. 2-113 KG-323 KG-325	App. I-1 App. I-5 App. I-13 App. I-14 App. I-15 TG-320 TS-300 TS-310
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(5) Distribution and retrieval of shop drawings:

Part 3, 1.5.1 g)	App. A-302.3	App. F-202.3	App. 10-5 App. 10-13	Annex 2.E.5 2.3.5	App. 2-113	App. I-1 App. I-5
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(6) Approval of drawings:

Part 3, 1.3.2 b) Part 3, 1.5.1 g)		App. F-202.3	App. 10.5	Annex 2.E.5 Table 7.A.1	App. 2-113 KG-324	App. I-1 App. I-5
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(7) Information on approved drawings, checklists, or other documents regarding Code Edition, pressure, temperature, minimum design temperature, welding, NDE, and heat treatment to be performed.

_____	App. A-302.3	App. F-202.3	App. 10-5	Annex 2.E.5 2.2.2 2.3.3	App. 2-113 KG-311.1 311.14	App. I thru TG-320
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(8) Identification of inspection and pressure relief device openings:

Part 1, 2.9.6 Part 1, 3.9.1.1.1 Part 1, 3.9.4.2	App. A-350	HG-320 HG-330 HG-400 Table 4-1:H-2 thru 4 HLW-6	UG-46	2.2.2(i) 4.5.16 Part 9	KG-311.11 KR-100 KR-130	TD-600 TD-690 TG-320 TR-130
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(9) Corrosion allowance:

_____	PG-27.4.3 Note 3	_____	UG-25	3.2.1.6 4.1.2 4.1.4 4.5.4	KD-114 KD-1203 KG-311.13	TD-100.4 TD-130
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(10) Inspection opening size:

—	PEB-10 PFT - 42 PFT-43 PG-28 PG-44	HG-330 HLW-310 Table 4-1:H-2 thru 4 HLW-6	UG-46	4.5.16	—	TD-690
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(b) Additional Results:

(1) Contents of User's Design Specification:

Part 3, 3.3.5.2 a)	—	—	—	2.2.2	KG-311	—
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(2) Registered Professional Engineer experienced in pressure vessel design that certifies the User's Design Specification:

Part 3, 3.3.5.2 a)	—	—	—	Annex 2.A.2.1	KG-311.14	—
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(3) Contents of *Manufacturer's Design Report*:

—	—	—	—	2.3.3	KG-323	—
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(4) Registered Professional Engineer experienced in pressure vessel design that certifies the *Manufacturer's Design Report*:

Part 3, 3.3.5.2 a)	—	—	—	Annex 2.B.2.1	KG-324	—
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(5) The Designer is an individual engineer, or group of engineers, experienced in high pressure vessel design that performs the required analysis of the vessel:

Part 3, 3.3.5.2 a)	—	—	—	Annex 2-A.1 Annex 2-B.1	KG-330	—
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(6) Revisions:

—	—	—	—	Annex 2.A Annex 2.B	KG-311 KG-323 KG-324	—
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(7) Restricted use of materials where fatigue is a factor in design:

—	—	—	—	3.2.1.4	—	—
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(c) Restriction of material used for Code Compliance.

Part 3, 1.5.1 i) Part 3, 3.2.1 a)	PB-5 PEB-5 PFT-5 PG-5 thru PG-14 PMB-5 PVG-5 PW-5 PWT-5 PFE-4 PL-5 thru 7 PTFH-5 PA-5 ASME B31.1 (BEP) 123 thru 125 App. A	HF-207	UB-5 UCD-5 UCI-5 UCL-10 UCS-5 UF-5 UG-5 thru UG-15 UHA-5 UHT-5 UHX-2 ULT-5 ULW-5 UNF-5 UW-5	3.2.1.1 3.2.2 Table 3-A.1	KD-100 KM-100	Article TM-1
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(d) Special provisions for design required by the applicable Modal Appendix requirements of Section XII.

Part 3, 1.2 e) Part 3, S6.3	—	—	—	—	—	TD-100 TD-610.8 TG-220.1 TG-310 TS-400
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(e) Overpressure protection requirements.

Part 1, 2.9	App. A-301 App. A-302 App. A-311 thru 316 PEB-15 PFT-24 PG-2.3 PG-67 thru PG-73 PMB-15 PVG-12 PFE-3 PTHG-12 PL-54	HG-400 HG-701 HLW-800	UG-125 UG-126 UG-127 ULW-125 UW-65	1.2.7 2.2.2 Part 9	Article KR-1 Article KR-2 Article KR-3 Article KR-4	TR-100 TR-200 TR-300 TR-400 TR-500
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(f) When the Code does not contain complete details to cover all details of design and construction, it is intended that the Manufacturer, subject to the acceptance of the Inspector, shall provide details of design and construction which will be as safe as those provided by the rules of the applicable Code of Construction.

Part 3, 1.2 b)	Preamble	Preamble	U-2(g)	—	—	TG-100.2(c)
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6.1.5 Material Control

(a) Specification to be used in construction.

Part 3, 1.5.1 i) Part 3, 3.2.1 a)	App. A-302.4 PG-5	App. F-202.4 HA-200 HB-1100 HC-200 HF-200 thru 204 HG-200 HG-201 HLW-200 thru 205 HW-500	App. 10-6 UG-1 UG-4	Annex 2.E.6 3.2 Part 3	Article KM-3 KM-100 KM-200 KM-400(a)	App. I-5 App. I-6 TG-320 TM-110 TM-120 TM-130 TM-150 TM-160 TM-170 TM-180 TM-190
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(b) Ordering of materials.

Part 3, 1.5.1 j) Part 3, 3.2.2	App. A-302.4	App. F-202.4 HA-200 HC-200 HF-200 HG-200 HLW-201	App. 10-6	Annex 2.E.6 3.2	App. 2-114	App. I-6 TG-320 TM-110 TM-120 TM-130
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(c) Substitution of materials.

—	PG-10	App. F-202.4 HF-200	Foreword UG-10	2.3.2.2	App. 2-114	App. I-6 TG-320 TM-110 TM-120 TM-130
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(d) Materials permitted by the applicable Modal Appendix for Section XII, Class 1, 2 and 3.

—	—	—	—	—	—	TM-100 TM-110(e)
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(e) Special provisions for material required by the applicable Modal Appendix.

—	—	—	—	—	—	TG-220.1 TM-100 TM-110(c)
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(f) Material Test Reports.

Part 3, 1.5.1 i)	App. A-302.4 PG-10	App. F-202.4 HF-201 HF-205 HLW-201	UG-93	Annex 2.E.6 3.2.6	App. 2-114 KM-101 KM-103	App. I-6 TG-320 TM-130.1(e) TM-140
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(g) Receipt inspection or means of checking that received Material conforms to the purchase order.

Part 3, 1.5.1 i)	App. A-302.4 PG-10 PG-11 PG-90.1.6 PG-105.4	App. F-202.4	App. 10-6 UG-10 UG-11 UG-93 UNF-5	Annex 2.E.6 2.3.3	App. 2-114	App. I-1 App. I-6 TG-320 TM-140
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(h) Control of receiving function for material, parts, and partial data reports.

Part 3, 1.5.1 i)	App. A-302.11 App. A-302.4 PG-11 PG-112.2.4	App. F-202.4	App. 10-6 UG-2 (h) UG-11 UG-120 (c)	Annex 2.E.6 Annex 2.E.7 Annex 2.C.2	App. 2-114 KS-120	App. I-6 TG -320 TM-140
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(i) Identification and traceability of materials while handling and storing.

Part 3, 1.5.1 i) Part 3, 3.2.2	PG-77	App. F-202.4 HF-210 HLW-201 thru 2 05	UG-77	Annex 2.E.6 3.2.7	App. 2-114 KF-112	App. I-6 TF-110 TG-320 TM-120 TM-140
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(j) Nonconforming materials and materials not identified or not produced to an allowable specification.

Part 3, 1.5.1 i) Part 3, 3.2.1 a)	App. A-302.6 PG-10 PG-78	App. F-202.6 HF-206 HLW-202	App. 10-6 App. 10-8 UG-10	Annex 2.E.8 3.2.1	App. 2-114 App. 2-116 KM-100	App. I-6 App. I-8 TM-120
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(k) NDE requirements for:

(1) Steel Castings:

—	PG-25 PG-25.2.1 ASME B31.1 (BEP) 102.4.6	NA	UG-7 UG-24 App. 7	3.8.2.2 3.8.3.1	—	App. I-6 App. I-10 App. X TM-190
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(2) Steel forgings:

—	—	NA	UF-45 UF-55	3.3.4 3.3.5 3.6.3 3.6.4	KE-230	—
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(l) Impact testing of material and report of tests.

Part 3, 2.5.3.2 a)	—	NA	App. W, Table W-3, Item 39 UG-84	3.11 3.12 3.13 3.14 3.15	Article KM-2 Article KT-2	App. I-6 TM-210 TM-220 TM-240 TM-250 TM-260
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(m) Verification of ASTM & AWS material to Code Edition and addenda to Section II requirements.

Part 3, 1.5.1 i)	Foreword	Foreword	Foreword	Foreword	Foreword	Foreword
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(n) Are stamped pressure parts that are constructed by welding, that do not require a *Manufacturer's Partial Data Reports*, verified for Code compliance?

Part 3, 3.2.2	PG-11	HF-203.1 HF-203.2 HF-203.3 HLW-203	UG-11	3.2.8	—	TM-110.10(c)
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(o) Drop weight tests.

—	—	—	—	3.11.3.3	—	—
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(p) *Manufacturer's Partial Data Reports* supplied for parts fabricated by welding subcontractor or vendor.

Part 3, 3.2.2 c) Part 3, 5.2.2 d)	PG-11 PG-112.2.5	HG-520.2 HLW-601.2	UG-120(c)	Annex 2.C.2 Annex 2.F.4 3.2.8.1	KM-102 KS-301 KS-302	TM-110.10 TS-310
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(q) Repair of materials by welding.

Part 3, 1.5.1 h) Part 3, 1.5.1 k) Part 3, 3.2.1 Part 3, 3.2.2 Part 3, 3.3	PG-78 PW-40		UCS-56(f) UF-37 UG-78	3.8.2.3 3.8.3.2 6.1.1.3	KF-113	TF-110.3
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6.1.6 Examination and Inspection Program

(a) Preparation and use of travelers, process sheets, or checklists for listing of examinations and inspections to be performed and for the Inspector to designate intended inspection points.

Part 3, 1.5.1 j)	App. A-301 App. A-302.5 App. A-302.13	App. F-100.1 App. F-202.10 App. F-202.5 HB-1500 HG-515 HLW-600 HW-900	App. 10-1 App. 10-7 App. 10-14 App. 10-15 U-2 UG-90 UG-92 UG-120	Annex 2.E.7 Annex 7.A.2 Table 7.A.1	App. 2-115 App. 2-123 KG-414	App. I-1 App. I-7 App. I-14 App. I-15 TG-320 TG-330
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(b) *Material Test Reports or Certificates of Compliance* for material, made available to the Authorized Inspector.

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.13.2.2	App. F-202.4	App. 10-15 (d)	3.2.6 7.3.1.1 Table 7.A.1	App. 2-114 KG-414	TG-320 TG-330 TM-120 TM-140
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(c) Transfer of material markings prior to or after dividing materials into two or more pieces.

Part 3, 1.5.1 i)	PG-77 App. A-300	App. F-202.4 HF-210 HLW-201	App. 10-6 UG-77	Annex 2.E.6 3.2.7	App. 2-114 KF-112	TF-110.2 TM-140.3
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(d) Notification of the Authorized Inspector prior to reaching a designated inspection point.

Part 3, 1.5.1 j)	PG-90.1	App. F-202.5 HG-515.2 HLW-600.2 HW-900	App. 10-7	7.2.3	App. 2-115 App. 2-123 KG-413 KG-414	App. I-7 TG-320 TG-420
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(e) Welded repair of materials, Authorized Inspector's concurrence prior to repairs.

Part 3, 1.5.1 n)	PG-78 PW-40.3.9	App. F-202.6 HG-515.3	UG-78	6.1.1.3	Article KE-3 KE-212 KF-113 KG-414(g)	TF-110.3(d) TG-320
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(f) Checklist or other means of documenting welding, NDE, and PWHT procedures to be employed.

Part 3, 1.5.1 k) Part 3, 5.2	App. A-300	App. F-202.5 App. F-202.7	App. 10	2.3.5	App. 2-115 App. 2-117 App. 2-118 App. 2-119 App. 2-123	App. I-7 App. I-14 TG-320
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(g) Shapes of plate; alignment of welded joints.

	PG-80 PG-81 PW-9 PW-33	HB-1305 HG-305 HLW-400 HW-700 HW-800 HW-812 HW-813	UG-80 UG-81 UW-31 UW-33	6.1.4 6.1.6	KF-120 KF-130 KF-233 KF-234	TF-120.5 TF-220.1 TF-220.3 TF-610.10
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(h) Final pressure tests; final inspection; dial range of pressure gages; and test media.

Part 3, 1.3.2 Part 3, 1.5.1 l) Part 3, 4.4 Part 3, 4.4.1 Part 3, 4.4.2	PEB-17 PG-99 PMB-21	HA-403 HA-406 HA-502.6 HC-402.1 HC-410 HC-502.6 HG-505 HG-510 HLW-502.2 HLW-505	UG-99 UG-100	7.6 8.1.4 8.2.3 8.2.5 8.3.5 Part 8	KT-300 KT-301 KT-302 KT-311 KT-312 KT-320 KT-330 KT-340 KT-400 KT-410 KT-420	App. I-7 TF-120.5 TG-320 TG-330 TT-200 TT-210(a) TT-220(a) TT-240
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(i) Pneumatic tests; limitations on use; post-test examination (leak tests); dial ranges of pressure gages; and test media.

Part 3, 4.4 Part 3, 4.4.1 Part 3, 4.4.2	—	—	UG-100	8.3	—	App. I-7 TF-120.5 TG-320 TG-330 TT-200 TT-210(b) TT-220(b) TT-240
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(j) Certification Mark stamps applied only with concurrence of the Authorized Inspector.

Part 3, 5.7.1	PG-106 PG-107	HG-515 HG-533.4 HLW-600	UG-90	Annex 2.F.3	KS-110 KS-140	TS-120 TS-130.3
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(k) Certification Mark stamp use.

Part 3, 1.4.2	PG-106 PG-107 PG-108 PG-109	HG-530 HLW-602	UG-118 UG-119	Annex 2.F.3 Annex 2.G.2.3 2.3.9	Article KS-1 Article KS-2 KF-360 KF-550 KF-650	App. I-1 TG-120.2 TG-320 TS-200.1(c)
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(l) *Manufacturer's Data Reports*. Additional requirements for stamping, nameplates, and entries on data reports, i.e., class, RT, PWHT, welded construction, and location of markings.

—	PG-107.2.3(b)(1) PG-111 PG-112.2.4(c) PG-112.2.8	HA-404 HC-402.2 HC-403 HG-520 HG-532 HG-533 HLW-601	App. 14-4 App. 17-10 App. 19-8 App. 20-4 App. 21-4 App. 22-6 App. 23-5 App. 27-8 App. 28-2(g) App. 32-8UG-11 Fig. UW-13.1 Note 2(c) UG-116(h)(1) UG-120(a)(2) UG-120(c)(2) UG-19(a)(1) UG-19(a)(2) UG-46(a) UG-90(c)(2) UHX-19.3 ULT-115 UW-51(b)	Annex 2.F.1 Table 2.D.1	KS-300 KS-301 KS-302	App. I-13 TG-120.2 TG-320 TS-100 TS-100.2 TS-130 TS-300 TS-310 TS-400
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(m) Nameplate data and nameplate attached to the boiler or pressure vessel.

Part 3, 1.3.2 c) Part 3, 5.7.1 Part 3, 5.7.2 c) Part 3, 5.7.3 Part 3, 5.7.5 Part 3, 5.8 thru 5.11	PEB-19 PG-106 PG-107 PG-108 PG-109 PG-110 PG-111 PMB-18	HG-515.2	App. 18 UG-116 UG-118 UG-119 UG-90(b)(17) UHT-115 ULT-115	Annex 2.F	KG-414(p)	TG-320 TG-330 TS-100 TS-130
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(n) Distribution of *Manufacturer's Data Report* and National Board Registration.

—	PG-112.3 PG-113.4	HG-520 HLW-601	UG-120	Annex 2.C.1.3	KS-300	TS-300.1
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(o) Field assembly program, if covered by the scope in the ASME *Certificate of Authorization* and provisions provided in the Quality System Manual.

—	App. A-302 PG-105 PG-106 PG-107 PG-108 PW-54.1	App. F-202 HG-532 HG-533	App. 10-2 U-2(h) UG-92 UG-117 UW- 26(d)	1.2.6	App. 2-100 App. 2-110 App. 2-112 KG-130 KG-413.1	App. I-1 TS-200.2 TS-200.5
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6.1.7 Correction of Nonconformities

(a) Definition of nonconformities; deficiencies found during receiving of materials during construction; and final tests.

Part 3, 1.5.1 s)	App. A-302.6 App. A-314 PB-33 PG-78 PW-40 PW-51.3 PW-54.2	App. F-202.6	App. 10-8 UG-78 UW-13(4)(b) UW-38 UW-51(b) UW-52(d)(2)(a)	Annex 2.E.8	App. 2-100 App. 2-116 App. 2-123	App. I-8 TF-110.3 TG-320 TG-330
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(b) Responsibility for resolution of nonconformities.

—	App. A-302 PG-104	App. F-202.6	App. 10-3 U-2(b) UG-90	Annex 2.E.8	App. 2-116	App. I-8 TG-320
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(c) Authorized Inspector concurrence of proposed repairs.

Part 3, 1.5.1 s)	App. A-302 PG-90.1.10	App. F-202.6 App. F-202.10	App. 10-1 App. 10-13 UG-90	Annex 2.E.8	App. 2-114 App. 2-115 App. 2-116 App. 2-123	App. I-8 TF-110.3 TG-320 TG-330
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(d) Documented records of repairs to correct nonconformities.

Part 3, 1.5.1 t) Table 1.5.1	App. A-302 PG-90	App. F-202.6	App. 10-8	Annex 2.E.8 Annex 2.C.3 2.3.5	App. 2-116 App. 2-123 KF-113	App. I-1 App. I-8
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6.1.8 Welding Control

- (a) All welding performed to requirements of Section IX plus additional Code section requirements.

Part 3, 2.2	PW-1.2.2 PW-1.2.3	App. F-202.7 App. 5-400 HG-515.2 HF-204.3HA-201 HLW-200 HLW-401 HLW-440 HLW-450 HLW-451 HLW-460.6 HW-401 HW-600 HW-610 HW-611 HW-701 HW-745 HW-820	Part UW	Annex 2.E.9 2.3.7 3.2.3 3.4.4 6.2	App. 2-117 KF-211 KF-214 KF-311 KF-312 KF-313 KF-611 KF-822	App. 1-9 TF-200 TF-210 TF-210.4 TG-320 TG-330
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- (b) All brazing performed to the requirements of Section IX and any additional requirements of the applicable Code sections.

—	PB-1.4.2 PB-1.4.3	HG-301.2 HB-1001 HB-1100 HB-1201 HB-1202 HB-1303 HLW-200 (h) (2) HLW-432	Part UB	—	—	—
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- (c) Documentation of Welding Procedure Specification (WPS), including Standard Welding Procedure requirements.

Part 3, 1.5.1 k) Part 3, 2.2.1 Part 3, 2.2.2	PW-1.2	App. F-202.7 HA-201 HLW-450 HW-401	UW-26 UW-28(d)	Annex 2.E.9 6.2	App. 2-117 KF-211 KF-214 KF-311 KF-312 KF-313 KF-611 KF-822	App. 1-9 TF-210 TF-210.4 TG-320 TG-330
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- (d) Documentation for brazing requirements.

—	PB-28	HB-1201 HB-1202	UB-31	—	—	—
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(e) Documentation and certification by the Manufacturer of the Procedure Qualification Report (PQR).

Part 3, 1.5.1 k) Part 3, 2.2.2 Part 3, 2.2.3 Part 3, 2.2.4	App. A-302.7	App. F-202.7 HG-515 (i) HLW-450 HW-610 Note 1	App. 10-9	Annex 2.E.9 6.2	App. 2-117 KF-211 KF-212 KF-214 KF-311 KF-312 KF-313 KF-611 KF-822	App. I-9 TF-210 TF-210.2 TG-320 TG-330 Note 1
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(f) Documentation and certification by the Manufacturer of the brazing qualification record.

_____	App. A-302	HB-1001 HB-1201 HB-1202	App. 10-1 Section IX, QB-100	_____	_____	_____
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(g) Documentation and certification by the Manufacturer of Welding Performance Qualifications (WPQ) or Welding Operator Performance Qualifications (WOPQ).

Part 3, 2.2.3	App. A-302.7 PW-1.2.3	App. F-202.7 HG-515(i) HLW-453 HW-613 Note 1	App. 10-9 UW-29	Annex 2.E.9 6.2 Note 1	App. 2-117 KF-215 KF-216 KF-313 KF-611 KF-822	App. I-9 TF-210 Note 1
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(h) Documentation and certification by the Manufacturer of brazer's qualification record.

_____	App. A-302 PB-29	HB-1202.4 HG-515(i)	App. 10-1	_____	_____	_____
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(i) Welder's and brazer's qualifications in process (log).

Part 3, 2.2.6 Part 3, 2.2.6.1	QB-322 QW-322 Note 2	Note 2	UW-26(d) Note 2	Note 2	KF-216 Note 2	TF-210(d) Note 2
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(j) Welding and brazing procedure specifications available to the Authorized Inspector and to the welders and brazers.

Part 3, 1.5.1 k)	App. A-302.7 PW-28.4 PW-47 PW-48 Note 3	HB-1202.4 HLW-453 HW-613 Note 3	UB-43 UW-37 UW-47 Note 3	Note 3	KG-414 Note 3	App. I-9 TF-210(c) TG-320 TG-330 Note 3
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(k) Authorized Inspector's prerogative to require requalification of WPSs, welders and welding operators.

Part 3, 2.2.6 b) Part 3, 2.2.6.1 c)	PW-47 PW-48	HW-910 HW-911	UW-48	Annex 7.A.3.2.6	—	—
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(l) Authorized Inspector's prerogative to require requalification of brazing procedure specifications.

—	PB-47 PB-48	HB-1501	UB-43	—	—	—
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(m) Welding Material.

Part 3, 1.5.1 i)	PW-5 Section II, Part C	App. F-202.4 HW-500	UG-9 UW-5 Section II, Part C	Annex 2.E.9 3.2.3	App. 2-114 KF-302 KF-303 KF-612 KM-100	App. I-6 TM-110.5
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(n) Brazing Material.

—	PB-5 PB-6 PB-7	HB-1100 HB-1102 App. F-202.4	UB-5 UB-6 UB-7	—	—	—
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(o) Control of electrodes and other welding materials - identification, storage, and handling.

Part 3, 1.5.1 i)	App. A-302.4 App. A-302.7 Section II, Part C, SFA wire specification	App. F-202.4 App. F-202.7 Note 4	App. 10-6 App. 10-9 Section II, Part C, SFA wire specification	Annex 2.E.9 3.2.3 6.6.5.2 6.2.3.1 Note 4	App. 2-114 KF-205 Note 4	App. I-6 TF-220.8 TM-110.5 Note 4
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(p) Welder's identification mark for identification of welds performed.

Part 3, 2.2.5	PW-28.4	HW-613	UW-37	6.2.5.4	KF-238	App.I-9 TF-210(e) TF-210.3(e) TF-220.7
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(q) Brazer's identification mark for identification of brazed joints performed.

_____	PB-29.2		UB-32 (d)	_____	_____	_____
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(r) Preparation and alignment, including tack weld incorporated or removed from welded joints.

_____	PW-29 PW-31 PW-33 PW-34	HW-801 HW-810 HW-812 HW-813	UW-31 UW-32 UW-33 UW-37	6.1.4 6.1.5 6.1.6	KF-233 KF-234	App. I-9 TF-220.1 TF-220.3 TF-610.10
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(s) Preparation and alignment of brazed joints.

_____	PB-30 PB-31	HB-1305 HB-1306 HB-1307 HB-1400	UB-34 UB-35	_____	_____	_____
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(t) Supervision, instruction, and assignment of welders and welding operators.

_____	App. A-302.7 PW-1.2	App. F-202.7 HW-401 HG-515.2	App. 10-9 UW-37	Annex 2.E.9 6.2.2.1	App. 2-117	App. I-9 TF-210
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(u) Supervision, instruction, and assignment of brazers and brazing operators.

_____	PB-1.4	App. F-202.7 HB-1202.2 HG-515.2	UB-30	_____	_____	_____
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(v) Use of welders not in the employ of the Manufacturer.

_____	PW-1.2	HW-820.8	UW-26(d)	2.3.7.4 6.2.2.1(b)	KG-420	App. I-9 TF-210.1
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(w) Use of brazers not in the employ of the Manufacturer.

_____	PB-1.4	HW-820.8	UB-30(d)	_____	_____	_____
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(x) Lugs and attachments.

—	PFT-30.3 PFT-46 PG-55 PW-16.2 PW-28.1 PW-43	HB-1304 HG-725	UB-31 UG-4 UG-22 UG-55 UG-82 UHT-85 ULW-22	1.2.3 3.2.2 3.5.3 4.2.5.6 6.1.2.8	KD-720 KF-214 KF-620 KF-825.6	App. I-9 TF-120.4
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(y) Fit-up examinations.

Part 3, 1.3.2 Part 3, 1.5.1 j)	PW-31 PW-33 PW-34	HG-515.2 HW-801 HW-810	UG-95 UW-33	6.2.4.1 6.2.4.2 6.2.4.3 6.2.4.4 6.2.4.5 6.2.4.7 6.2.4.8 6.2.4.9 7.4.1.3	KF-230 KF-233 KF-234	App. I-9 TF-120.5 TG-320(l) TG-330(j)
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(z) Examination of finished welds.

Part 3, 1.3.2 Part 3, 1.5.1 j)	PW-35	HLW-460.8 HW-810(c)	UW-35 UW-36	7.4	KF-204 KF-614	App. I-9 TF-120.5 TF-220.4
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6.1.9 Nondestructive Examination (NDE)

(a) Provisions in the Quality System Manual for procedures and/or instructions for NDE requirements.

Part 3, 1.5.1 h) Part 3, 1.5.1 k)	App. A-302.8	NA	App. 10-10	Annex 2.E.10	App. 2-118	App. I-10
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(b) Requirements for radiographic examination (RT).

Part 3, 2.5.3 e)	App. A-250 PG-25 PW-11 Table PW-11 PW-41 PW-51		App. 3-2 App. 4 App. 7-2 (c) App. 7-3(a)(3) App. 20-3 UCL-35 UCL-36 UCS-19 UCS-57 UCS-68 UG-116 UG-24 UHA-21 UHA-33 UHT-57 ULW-51 ULW-52 ULT-57 UW-11 UW-14 UW-2 UW-34 UW-35 UW-51 UW-52 UW-9	3.8.2.2 3.8.3.1 4.16.4.3 6.1.1.3 6.2.4.1 6.2.4.9 7.4.10.2 7.4.11.2 7.4.11.5 7.4.11.9 7.4.4 7.4.8.1 7.4.8.2 7.4.9.2 7.5.3 Table 7.2 Table 7.3 Table 7.4 Table 7.5 Table 7.7	KE-101 KE-243 KE-251 KE-332 KE-221 KE-231 KE-252 KE-300 KE-322 KE-332 KF-825	App. I-10 App. IV TE-110.2 TE-230 TE-250.1 TE-250.2 TF-110.3 TF-220.10 TF-220.4 TF-410.2 TG-320 TW-100.1 TW-130.4
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(c) Requirements for ultrasonic examinations (UT).

	PW-11 Table PW-11 PW-52		App. 12 App. 3-2 App. 7-2(d) App. 7-3(b)(3) App.20-3 UF-5 UF-55 UG-116 ULT-57 ULW-52 ULW-53 ULW-57 UW-11 UW-2 UW-51 UW-53	3.3.3 3.3.4 3.6.2 3.6.3 3.8.2 3.8.3 3.9.3 6.7.2 7.4.4 7.4.8 7.4.9.2 7.4.10.1 7.4.11.2 7.4.11.3 7.4.11.4 7.4.11.10 7.5.3.1(f) 7.5.4 7.5.5 Table 7.2 Table 7.3 Table 7.4 Table 7.5	KE-102 KE-212.4 KE-221 KE-222 KE-230 KE-231 KE-232 KE-241 KE-242 KE-252 KE-264 KE-265 KE-300(a) KE-301 KE-322 KE-333 KF-825	App. I-10 App. IX TE-110.3 TE-230 TE-250.3 TG-320 TW-100.1
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(d) Requirements for magnetic particle examinations (MT).

Part 3, 2.5.3 e)	App. A-260 PFT-12.2.6 PG-25.2.1 PG-93 PW-40.3 PW-54.3.3		App. 1-7(c) App. 20-3 App. 22-4 App. 3 App. 5-5 App. 6 App. 7-2(a) App. 7-3(a)(3) App. 7-4 UCS-56 UCS-68 UF-31 UF-32 UF-37 UG-103 UG-24 UG-93 UHT-57 UHT-83 UHT-85 ULW-52 ULW-53 ULW-56 ULW-57 UW-13 UW-42	3.3.5 3.7.2 3.8.2 3.9.3.2 3.11.2.9 4.16.4.3 4.18.12.3 6.1.1.3 6.1.2.9 6.1.3.1 6.1.3.3 6.1.4.2 6.1.4.4 6.2.4.9 6.6.5.6 6.7.6.3 6.7.7.2 7.4.5 7.4.7 7.4.9.3 7.4.10.2 7.4.11.3 7.4.11.4 7.4.11.7 7.4.11.8 7.4.11.9 7.4.11.10 7.5.5.5 7.5.6 7.6.1 7-A.2.2 Table 7.2 Table 7.4 Table 7.5	App. 2-118 KE-103 KE-211.(a)(3) KE-211.(a)(4) KE-212.4 KE-213 KE-221(c) KE-231(c) KE-233 KE-263 KE-300(b) KE-300(c) KE-322 KE-324 KE-325 KE-334 KE-400 KF-825.2 KF-825.3 KF-825.6 KF-825.7 KF-825.8	App. I-10 App. V TE-110.4 TE-200 TE-210 TE-240 TE-250.1 TE-250.4 TF-110.3 TF-220.10 TG-320
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(e) Requirements for liquid penetrant (PT).

Part 3, 2.5.3 e)	App. A-270 PFT-12.2.6 PG-25.2.1 PG-93 PW-40.3 PW-54.3.3		App. 1-7(c) App. 3-2 App. 5-5 App. 8 App. 7-2(b) App. 7-3(a)(4) App. 7-4 App. 20-3 App. 22-4 UCS-56 UCS-68 UF-31 UF-32 UF-37 UG-24 UG-93 UG-103 UHT-57 UHT-83 UHT-85 ULW-52 ULW-53 ULW-56 ULW-57 UW-13 UW-42 ULT-57	3.3.5 3.6.4 3.7.2 3.8.2.2 3.8.2.3 3.8.3.1 3.9.3.2 3.11.2.9 4.16.4.3 6.1.1.3 6.1.2.9 6.1.3.1 6.1.3.3 6.1.4.2 6.1.4.4 6.2.4.8 6.2.4.9 6.4.6.4 6.6.5.6 6.7.6.3 6.7.7.2 7.4.5 7.4.7 7.4.9.3 7.4.9.4 7.4.10.2 7.4.11.7 7.4.11.8 7.4.11.9 7.5.7 7.6.1 Table 7.2 Table 7.4 Table 7.5 7-A.2.2	App. 2-118 KE-104 KE-211(a)(3) KE-211(a)(4) KE-212.4 KE-213 KE-221(c) KE-231(c) KE-233 KE-263 KE-300(b) KE-300(c) KE-300(e) KE-322 KE-324 KE-325 KE-334 KE-400 KF-825.2 KF-825.3 KF-825.6 KF-825.7 KF-825.8	App. I-10 App. VI TE-110.5 TE-200 TE-210 TE-240 TE-250.1 TE-250.5 TF-110.3 TF-220.10 TG-320
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(f) Requirements for Visual Examination (VT)

—	PG-75 B31.1, 136.4.2	—	—	7.4.1.1 7.5.2	—	—
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(g) Requirements for Eddy current (ET).

_____	_____	_____	_____	7.5.5.3 7.5.8 Table 7.5 Annex 7-A.2.2 Table 7-A.1	App. 2-118 KE-241 KE-244	_____
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(h) Responsibility for NDE.

Part 3, 1.5.1 j) Part 3, 4.2	App. A-302.8	_____	App. 10-10 UG-90	Annex 2.E.10 2.3.8 Annex 7-A.2.1 Annex 7-A.2.2	App. 2-118 KE-113 KE-114 KE-200 KF-825	App. I-10 TE-100 TE-110.1 TG-330(j)
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(i) Level III examiner appointed for RT, UT, MT, or PT, in-house or subcontracted.

Part 3, 4.2	PG-25 PW-50	_____	App. 12-2 UW-51 UW-54 Note 5	Note 5 7.3 2.3.7	KE-110 KE-112 KE-113(a) KE-114 KG-420	App. I-1 App. I-10 TE-120.1 TE-120.2 TE-120.3 TE-120.4 TE-120.5 TG-320.2 Note 5
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(j) RT and UT examiners qualified in accordance with the Employer's Written Practice using current Code-accepted Editions of SNT-TC-1A, CP-189, or a central certification program.

Part 3, 4.2	PW-50.2 Table A-360	_____	App. 12-2 UW-54	7.3 7.5.3 7.5.4 7.5.5	App. 2-118 KE-110 KE-112	App. I-1 App. I-10 TE-120.2 App. IX
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(k) MT, PT, and ET examiners certified competent by Employer.

Part 3, 4.2	PG-25 PW-50	_____	App. 6-2 App. 8-2	7.5.6 7.5.7 7.5.8	KE-111 KE-112 KE-113 KE-114	App. I-1 App. I-10 TE-120.3 TE-120.4 TG-320.2 App. V App. VI
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- (l) NDE reports, including film and interpretation sheets, must be made available for Authorized Inspector review.

Part 3, 1.5.1 o)	PG-11 PW-52 B31.1, 136.4.2	_____	App. 10-13 App. 12-4 UG-11	Annex 2.E.15.4 Note 6 Annex 7-A.3.2.6 Table 7-A.1	App. 2-123 KG-414 KS-320	App. I-10 Note 6
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- (m) Requalification of procedure and/or examiners if Authorized Inspector doubts effectiveness of results obtained.

_____	PG-90.1.12	NA	U-2(e) UG-90	Annex 7-A.3.2.6	_____	TE-110.1
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- (n) UT, MT, VT, and ET examinations must be performed in accordance with Written Procedures.

Part 3, 4.2	App. A-260 App. A-270 PG-25	_____	App. 6-1 App. 8-1 App. 12-1 UW-53	7.4.1.1 7.5.2 7.5.4 7.5.5 7.5.6 7.5.8	App. 2-118 KE-105	App. I-10 TE-110.1 TG-320.2
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- (o) Welded repair of material by the material Manufacturer.

Part 3, 3.2.1	Per the applicable material specification in Section II, Parts A and B	_____	Per the applicable material specification in Section II, Parts A and B	3.2.6.1 3.8.2.3 3.8.3.2 6.1.1.3	KE-212 KE-214 KM-101	Per the applicable material specification in Section II, Parts A and B
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- (p) Welded repairs of material by the Certificate Holder.

Part 3, 3.2.1	PW-40	_____	UF-37 UG-78	6.1.1.3	KE-200 KE-212 KE-213 KE-214 KE-266	App. I-10 TF-110.3
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6.1.10 Heat Treatment

- (a) Heat treatment required by applicable Code section provided for and controlled by Certificate Holder. See Material Specification in Section II, Parts A and B for supplemental requirements.

Part 3, 1.5.1 h) Part 3, 1.5.1 k) Part 3, 2.5	App. A-302.9 PG-12.3 PG-19 PG-25 PG-31.4 PG-77.4 PW-10 PW-19 PW-27 PW-39 PW-40 PW-49 PWT-11 PWT-12		App. 10-1 App. 22-4 App. 27-7 App. 31-2 App. 34-2 App. 7-4 App. R UCS-56 UCS-68 UF-31 UF-5 UF-52 UG-79 UG-84 UG-85 UHA-105 UHA-32 UHA-44 UHT-56 UHT-80 ULC-3 ULC-34 ULW-26 ULW-56 UNF-56 UNF-79 UW-10 UW-11(d) UW-2 UW-40 UW-49	Annex 2.E.11 Figure 3.1 3.4.2 3.4.3 3.10.2 3.10.3 3.10.6 6.4.2 6.4.3 6.4.4 6.4.5 6.4.6 6.5.5 6.6.6 6.6.7 6.7.6 6.8.10 7.3.3 Tables (6.2, 6.3, 6.5, 6.8, 6.9, 6.10, 6.11 6.11A, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17)	App. 2-119 KF-400 KF-402 KF-411 KF-412 KF-413 KF-420 KF-630 KF-830 KT-111 KT-112 KT-113 KT-222	App. I-11 Article TF-7 TG-320 TG-330 TM-140.2
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- (b) Responsibility and Quality System monitoring; review of results.

Part 3, 1.5.1 0)	PW-39		UW-40	Annex 2.E.11 7.4.10.3	App. 2-119	App. I-11 TG-320 TG-330
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- (c) If subcontracted, are controls provided to ensure procedures are followed? Are temperature charts required?

Part 3, 1.5.1	PW-38 PW-39		UW-40	Annex 2.E.11 2.3.7	App. 2-114 App. 2-119 KF-402 KG-440	App. I-11 TG-320.2 TM-140.2
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(d) Heat treatment records available to Authorized Inspector.

Part 3, 1.5.1 0)	App. A-302.9	—	App. 10-11	Annex 2.E.13 7.4.10.3	App. 2-119 App. 2-123 KF-402 KG-414	App. I-11 App. I-15 TG-330
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(e) Control of material and parts sent outside of the shop or job site. Controls upon return.

Part 3, 3.2.1	PG-77	—	UG-77	—	App. 2-119 KF-112 KM-102	App. I-1 App. I-11 TG-320.2
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(f) Test specimens or coupons specified as per applicable Code section.

—	—	—	UHT-81	3.10.2 3.10.3 3.10.4 3.10.5	KT-111 KT-112 KT-113	App. I-11 TF-310.2 TF-610.3
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(g) Hardness tests required.

Part 3, 3.2.1	PG-10.1.2.3	NA	UF-31	6.7.6.3	KF-642	—
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(h) Accumulated heat treatment time to be considered.

—	PW-39.3	NA	UCS-56(b)	3.10.6.2	KF-402.1 KF-420	TF-710(b)
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6.1.11 Calibration

(a) Responsibility for calibration program described in the Quality System Manual.

Part 3, 1.5.1 m) Part 3, 4.4 c)	App. A-302.1 App. A-302.10	App. F-202.2 App. F-202.8	App. 10-1 App. 10-12	Annex 2.E.12	App. 2-120	App. I-12 TT-240
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(b) Records.

Part 3, 4.3	App. A-302.13.2.2 App. A-302.14.2.2	App. F-202.8 Note 8	App. 10-12	Annex 2.E.12 Note 8	App. 2-120	App. I-12 Note 8
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(c) Hydrostatic test or pneumatic test gages to be calibrated when error is suspected.

Part 3, 4.3	PG-73.4.4	HLW-502.2 HA-403 HC-402.1	App. 10-12	8.1.4	KT-420	App. I-12 TT-240
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(d) Hydrostatic test gages to be calibrated every six months.

—	—	—	—	8.1.4	KT-420	—
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(e) Proof test gages to be calibrated before test and at any time error is suspected.

—	App. A-22.11.3	HA-403 HC-402.1 HG-505 HLW-502.2	UG-102(c)	—	—	TT-240
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(f) Calibration of impact test equipment.

—	—	—	UG-84(b)(1) Note 8	Annex 2.E.12 Note 8	Note 8	TM-210.1 Note 8
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6.1.12 Record Retention

(a) Nonmandatory records included by the Manufacturer in his Quality Management System.

Part 3, 1.5.1 t) Part 3, Table 1.5.1	App. A-302	—	App. 10-1	Annex 2.E.13 Annex 2.C.3	App. 2-121 KS-320	App. I-1 App. I-13
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(b) Mandatory records.

Part 3, 1.5.1 t) Part 3, Table 1.5.1	App. A-302.11 PEB-18.5.1(c) PG-73.6.1(c)	HA-203 HC-502.10	App. 10-13 App. 17-9 UB-32(d) UG-117(a)(1)(c) UG-120 UW-29(d) UW-51(a)	Annex 2.C.3	KS-310 KS-320	Article TS-3 Article TP-6 App. I-13
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(c) Register *Manufacturer's Data Report* with the National Board or retain for 3 or 5 years, Sections I, IV and VIII, Division 1 and 3.

—	PG-113.3	HG-520.1 HLW-601.1 Note 13	UG-120	—	KS-320	Article TP-6
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(d) Register *Manufacturer's Data Report* with the National Board or retain for 10 years for Section VIII, Division 2 and Section XII.

—	—	—	—	Annex 2.C.1.3 Note 13	—	App. I-13 TS-300.1 Note 13
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NBIC	Section I	Section IV	Section VIII Division 1	Section VIII Division 2	Section VIII Division 3	Section XII All Classes
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(e) Supply copy of *Manufacturer's Data Report* to purchaser, user, or agent.

—	App. A-302.13.2.2 PG-113.3 PG-113.4	HG-520.1 HLW-601.1	App. 10-15 UG-120	Annex 2.C.1.3	KS-300 KS-301	App. I-13 TS-300.1
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(f) Supply copy of *Manufacturer's Data Report* to Authorized Inspector upon request.

—	App. A-302.13.2.2	HG-520.1 HLW-601.1	UG-120	Annex 2.C.1.3	KS-300	TS-300.1
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(g) Supply copy of *Manufacturer's Data Report* to enforcement authority (Jurisdiction or competent authority).

—	PG-112.3	HG-520.1(a) HLW-601.1	UG-120(a)(3)	Annex 2.C.1.3	KS-300	App. I-13 TS-300.1
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(h) Copies of applicable *Manufacturer's Partial Data Reports* are to be attached to Master *Manufacturer's Data Report*.

—	PG-112.1	HG-520.2 HLW-601.2 App. 4 HLW-6	UG-120	Annex 2.C.2	KS-301	App. I-13 TG-320 TS-310
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(i) All required supporting documentation to be available to the Authorized Inspector at the time the *Manufacturer's Data Report* is signed.

—	App. A-302.13.2.2	HG-515.3	App. 10-15	Annex 2.E.15.4 Annex 7.A.2.1	App. 2-123 KG-414	TG-320 TG-330
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(j) National Board registration numbers controlled and recorded.

—	Note 14					
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(k) Section VIII, Division 2 documentation to be stored in a safe repository to maintain protection from deterioration and damage.

—	—	—	—	Annex 2.C.1.3	—	—
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(l) Special Requirements, Section VIII, Divisions 2 and 3:

(1) User's Design Specification and Manufacturer's Certified Design Report, plus supporting documentation, to be maintained for a minimum of 3 years after completion of the vessel.

—	—	—	—	Annex 2.C.3	KS-320	—
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- (2) User's Design Specification and Manufacturer's Certified Design Report, plus supporting documentation, to be submitted to the owner when the *Manufacturer's Data Report* is certified by the Manufacturer.

_____	_____	_____	_____	Annex 2.C.3	KS-320	_____
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6.1.13 Sample Forms

- (a) Forms used to control functions of the Certificate Holder's system and their use explained in the text. Standard Code forms, such as *Manufacturer's Data Reports*, WPSs, PQRs, etc., need not be included.

Part 3, 1.5.1 q)	App. A-302.12	App. F-202.9	App. 10-14	Annex 2.E.14	App. 2-122	App. I-15
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- (b) Sample tags or labels.

Part 3, 1.5.1 q)	App. A-302.12	App. F-202.9 HC-502.9 HA-509.9	App. 10-14 UHX-19.2	Annex 2.E.14	App. 2-114 App. 2-122 KF-112	App. I-6 App. I-15 TF-110.2
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- (c) Synopsis of internal procedures the company uses and refers to in the text. These are NOT required as an inclusion in the manual and may be referred to and explained in the text.

_____	App. A-301	App. F-100.1 HC-502.9 HA-502.9	App. 10-1 UG-90	Annex 2.E	App. 2-100	App. I-1 TG-320
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- (d) Compatibility

_____	App. A-302.12	App. F-202.9 HC-502.9 HA-502.9	App. 10 -14	Annex 2.E.14	App. 2-122	App. I-15
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6.1.14 The Inspector

- (a) Definition of accredited inspection agency and inspector. (See 4.16 of this Guide.)

Part 3, 1.3	App. A-302.13 PG-91	App. F-202.10 HG-515.3 HLW-600.1	App. 10-15 UG-91	2.4	App. 2-123 KG-411 KG-431	TG-410
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- (b) Liaison with Inspector for progress of work and notification of impending inspection points.

Part 3, 1.5.1 j)	App. A-302.5	App. F-202.5 HG-515.2 HLW-600.2	App. 10-15	Annex 7.A.2.1 7.2.3	App. 2-123 KG-413.2	App. I-4 App. I-16 TG-430
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(c) Access to plant or site where code work is being performed.

_____	App. A-302.13 PG-90	App. F-202.10 HG-515.2 HLW-600.2	App. 10-15 UG-92	7.2.2	App. 2-123 KG-413.1	App. I-16 TG-420
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(d) Current copy of the Quality System Manual.

Part 3, 1.5.1 o)	App. A-302.13.2.1	App. F-202.10.2.1	App. 10-15	Annex 2.E.15.3	App. 2-123	App. I-16
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(e) AI notification prior to repairs being performed.

Part 3, 1.3.1 Part 3, 1.5.1 j) Part 3, 1.5.1 n)	App. A-302.13.2.2 PG-78 PG-90.1.10	_____	App. 10-15 UG-78 UG-90 (b)	6.4.5.2(c) 6.4.6.4(c)(1) 7.2.3	App. 2-116 App. 2-123 KF-113 KG-414(g)	App. I-16 TF-110.3(d) TG-320
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(f) Access to plant or field site for Inspector's supervisor for additional help for Inspector, as required by workload, and for annual National Board audits of the Inspector's performance of duties and the Quality Management System.

_____	Note 9					
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6.1.15 Internal Audits

Inclusion is NOT mandatory but may be stated as a part of the Certificate Holder's system, if desired.

6.1.16 Registration with The National Board

(a) Registration of pressure-retaining items by all Certificate Holders is recommended, and under various jurisdictional laws and regulations is required.

_____	Note 10 Note 13 Note 14	HG-520.1 HLW-601.1 Note 10 Note 13 Note 14	UG-120 Note 10 Note 13 Note 14	Annex 2.C.1.3 Note 10 Note 13 Note 14	Note 10 Note 13 Note 14	TS-300.1(b) Note 10 Note 13 Note 14
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6.2 Review of Shop and Field Sites

6.2.1 Initial Shop Tour

See 1.1 b) 2) j) of this Guide.

6.2.2 Initial Meeting with Company Personnel and Review of Application

See 3.1 of this Guide.

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6.2.3 Quality System Manual Critique

See 3.2 of this Guide.

6.2.4 Review (General Requirements)

(a) Areas of interest to be visited.

Part 3, 1.4.1	App. A-302	App. F-202 HG-540.4	App. 10	Annex 2.E	App. 2 KS-250	App. I-1 TG-320 TS-200.5
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(b) Code sections, plus addenda, to be held by the Certificate Holder and available for reference.

Part 3, 1.5.1 o)	Note 12					
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(c) B31.1.

_____	Preamble PG-58.3	_____	_____	_____	_____	_____
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(d) Within the manual, how is the distribution of controlled copies and, when applicable, uncontrolled copies of the Quality System Manual accomplished?

Part 3, 1.5.1 e)	App. A-302	App. F-100 HG-540.4 CA-1 Note 16	App. 10-1	Annex 2.E.15.3	App. 2-123	App. I-1 App. I-3 App. I-4
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6.2.5 Engineering and Design

(a) Preparation of calculations and drawings.

Part 3, 1.5.1 g)	App. A-302.3 PG-21 PG-22	App. F-202.3 HG-515.2 HC-502 HA-502	App. 10-5 UG-21 UG-22	Annex 2.E.5 2.3.3	App. 2-113 App. 2-123	App. I-5 TG-320
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(b) Review of customer supplied drawings, calculations, etc.

Part 3, 1.5.1 g)	App. A-302.3	App. F-202.3	App. 10-5	2.3.1	App. 2-113 App. 2-123 KG-310	App. I-1 App. I-5 TG-320
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(c) Distribution.

Part 3, 1.5.1 g)	App. A-302.3	App. F-202.3	App. 10-5	Annex 2.E.5	App. 2-113	App. I-1 App. I-5
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NBIC	Section I	Section IV	Section VIII Division 1	Section VIII Division 2	Section VIII Division 3	Section XII All Classes
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(d) Special Requirements Section VIII, Divisions 2 and 3:

(1) User's Certified Design Specifications.

Part 3, 3.3.5.2	—	—	—	Annex 2.A 2.2.2.3	App. 2-113 App. 2-123 KG-310 G-311.14	—
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(2) Manufacturer's Certified Design Report.

Part 3, 3.3.5.2	—	—	—	Annex 2.B 2.3.3.2	App. 2-113 App. 2-123 KG-323 KG-324	—
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(3) Revisions to (d)(1) and (d)(2) above.

—	—	—	—	Annex 2.E.5 Annex 2.E.6 Annex 2.E.8	App. 2-113 App. 2-123	—
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(e) How and by whom are Code materials specified?

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.4 Foreword	App. F-202.1 App. F-202.4	App. 10-6 Foreword	2.3.1.1 2.3.2	App. 2-113	App. I-4 App. I-6 TM-130 TM-150 TM-160 TM-170 TM-180 TM-190
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(f) Restricted allowable materials when cyclic analysis is required.

—	—	—	—	3.2.1.4	—	—
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NBIC	Section I	Section IV	Section VIII Division 1	Section VIII Division 2	Section VIII Division 3	Section XII All Classes
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(g) How is information regarding welding, NDE, impact test, pressure test, PWHT, etc., transmitted?

Part 3, 1.5.1 k)	PG-99 PW-8 PW-11 PW-28 PW-39	HG-510 HG-511 HG-515.2 HLW-401 HLW-505 HW-701 App. F-100	UCS-66 UG-84 UG-85 UG-90 UW-26	Annex 2.E.5 2.2.2	App. 2-113 App. 2-115 App. 2-123	App. I-1 App. I-4 Article-TE Article-TT TF-710 TG-320 TM-200 TM-210 TW-100 TW-100.1
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(h) Is overpressure protection provided for in the design?

Part 3, 1.5.1 g)	PG-67 thru PG-73 PG-112.2.8	HG-400 HLW-800	UG-125 thru 137	1.2.7 2.2.2 Part 9	KG-116 KG-311.11	App. I-5 TR-100
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(i) Impact test materials.

—	—	—	UG-84	3.11 3.12 3.13 3.14 3.15	KF-615 KM-212 KM-233 KM-234 KM-250 KM-251 KM-261 KM-262	App. I-5 App. I-6 TG-320 TM-210 TM-220 TM-230 TM-240 TM-250 TM-260
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6.2.6 Purchase Function

(a) How initiated?

Part 3, 1.5.1 f)	App. A-302.4 PG-11	App. F-202.4	App. 10-6 UG-11	Annex 2.E.6 2.3.3	App. 2-114	App. I-5 App. I-6 Article TM TG-320
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(b) Are purchase orders reviewed?

—	App. A-302.4 PG-11	App. F-202.4	App. 10-6 UG-11	Annex 2.E.6	App. 2-114	App. I-6 TG-320 TM-100
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(c) Is traceability of material certifications to the purchase order maintained?

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.4 PG-77	App. F-202.4	App. 10-6 UG-90 UG-93	Annex 2.E.6 3.2.7 6.1.1.2 7.3.1	App. 2-114	App. I-6 TF-110.2 TG-320 TM-110 TM-130 TM-140
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6.2.7 Receiving of Materials and Parts

(a) How is material identified and controlled upon receipt?

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.4	App. F-202.4	App. 10-6	2.E.6	App. 2-114 KF-205	App. I6 TF-110.2 TG-320 TM-140
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(b) How is received materials inspected? Dimensions, marking, manufacturing defects, shipping damage, etc.?

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.4	App. F-202.4 HF-210 HLW-201 HG-515.2 HLW-600.2	App. 10-6	3.2.7 7.3.1	App. 2-114 KF-112	App. I-6 TF-110.2 TG-320 TM-140
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(c) Control of nonconforming material or parts.

Part 3, 1.5.1 i) Part 3, 1.5.1 s)	App. A-302.6	App. F-202.6 HF-205 HG-515.2 HLW-202	App. 10-8	Annex 2.E.8	App. 2-114 App. 2-116	App. I-16 App. I-8 TF-110.3 TG-320
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(d) Is a *Manufacturer's Partial Data Report* required and provided with the part?

Part 3, 3.2.2	App. A-302.4 PG-11 PG-112.2.4	HF-203 HG-520.2 HLW-601.2	App. 10-6 UG-11 UG-120 (c)	Annex 2.C.2	KS-301 KS-302	App. I-6 TG-320 TM-110.10
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(e) Is the material control program found in use as described in the Quality System Manual?

Part 3, 1.5.1 i)	App. A-302.4	App. F-202.4 HG-515.2 HLW-600.2	App. 10-6	Annex 2.E.6	App. 2-114 App. 2-116 App. 2-123	App. I-1 App. I-6 TG-320
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6.2.8 Demonstration Item

(a) Has the Quality Management System described (including documentation) been followed on the demonstration items?

Part 3, 1.4.1 c)	App. A-300 PG-111 PG-112	App. F-100 HG-540.4	App. 10-1 App. 10-13	Annex 2.E Annex 2.C	App. 2-100	App. I-1 TG-120.2 TG-120.3 TG-320 TS-200.4
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(b) Are plant or subcontractor facilities adequate and available for the type of products to be fabricated?

—	PG-105.4	App. F-100 HG-540.4 CA-1 Note 16	App. 10-1	Annex 2.E	KG-420	App. I-1 TG-320.2
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(c) Prep & alignment.

—	PG-80 PW-9 PW-13 PW-31 PW-33 PW-34	HB-1305 HB-1400 HLW-400 HW-701 HW-801 HW-810 HW-812 HW-813	UG-79 UG-80 UG-81 UW-9 UW-13 UW-26 UW-31 UW-33 UW-35 UW-37	6.1.3 6.1.4	KF-130 KF-132 KF-231	App. I-9 TF-120 TF-220.1 TF-220.3 TG-320
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(d) Welders' stamping or maps.

Part 3, 2.2.5	PW-28.4.3	HLW-453 HW-613	UW-29	6.2.5.4	KF-238	App. I-9 TF-210.3(e) TF-220.7
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(e) Welding documents, availability.

Part 3, 1.5.1 o) Part 3, 2.2.4	Note 3					
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(f) Tack welds.

—	PW-31.3	HLW-460.8 HW-810	UW-31	6.1.4.2	KF-233	App. I-9 TF-220.1(c)
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(g) Surface preparation of weld joint: instruction, supervision, and assignment of welders and welding operators.

—	App. A-302.7 PW-29 PW-35 PW-36	App. F-202.7 HB-1001 HB-1400 HLW-401 HW-401 HW-801	App. 10-9 UW-29 UW-30 UW-32	6.1.5 6.2.2	App. 2-117 KF-203 KF-231 KF-232	App. I-9 TF-220.2
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(h) Are material identification markings visible?

—	PG-77.1	HF-210 HLW-201	UG-77(a) UG-94	3.2.7 7.3.1	KF-112	App. I-6 TF-110.2 TG-320 TM-140.3
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(i) Final weld finish.

—	PW-35	HW-820 HLW-460	UW-35	6.2.4 7.5.2 6.6.5.5	KF-204 KF-614	App. I-9 TF-220.4
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6.2.9 Welding and Brazing Controls (Welding and Brazing Documentation)

(a) Welding documentation:

(1) Are welding and brazing procedures specifications complete?

Part 3, 2.2.1 Part 3, 2.2.2 Part 3, 2.3	Note 1	HB-1201 HB-1202 HLW-401 HW-610 HW-613 Note 1	UWA-51(f)(2) Note 1	6.2.2 Note 1	KD-1101 KF-211 KF-214 KF-310 KF-311 KF-611 KF-822 KG-414 Note 1	App. I-9 TF-200 TF-210 Note 1
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(2) Are Procedure Qualification Records (PQRs) complete and traceable to applicable WPS and BPS? Are they dated and certified by a person in the employ of the Certificate Holder?

Part 3, 2.2 Part 3, 2.2.4	PW-28 Note 1	HB-1202 HLW-401 HW-613 Note 1	UB-31 Note 1	6.2.2 7.3.4	KD-1101 KF-211 KF-310 KF-311 KF-611 KF-822 KG-414 Note 1	App. I-9 TF-200 TF-210 Note 1
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(3) Are welder and brazer performance qualification records complete? Are they dated and certified by a person in the employ of the Certificate Holder?

Part 3, 2.2 Part 3, 2.2.3	PW-28 Note 1	HB-1202 HLW-401 HW-613 Note 1	UB-32 Note 1	6.2.2 7.3.5	KF-211 KF-215 KF-313 KF-611 KF-823 KG-414 Note 1	App. I-9 TF-210 TF-210.3 Note 1
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(4) Is a record kept to ensure qualifications are current?

Part 3, 2.2.6.1	Note 2	App. I-9 TF-210 Note 2				
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(5) Are copies of the WPS, or comparable instructions, available to the welders and welding operators in the work area?

—	Note 3	App. I-9 Note 3				
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(6) Are copies of the WPS, or comparable instructions, available to the Inspector?

Part 3, 2.2.4	Note 3	App. I-9 TF-210 Note 3				
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(b) Is unopened welding and brazing material inspected at receiving and stored in a dry area?

—	Note 4	HB-1102 Note 4	UG-9 Note 4	3.2.3 6.2.3.1 Note 4	KF-205 Note 4	TM-110.5 Note 4
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(c) Is heated oven storage provided in welding issue area for covered electrodes, such as low hydrogen and stainless steel, when removed from sealed containers?

_____	Note 4	Note 4	Note 4	6.2.3.1 Note 4	KF-205 Note 4	Note 4
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(d) Is issue and return of welding materials controlled as described in the Quality System Manual?

_____	App. A-302.4 App. A-302.7	App. F-202.7	App. 10-6 App. 10-9	6.2.3.1	App. 2-117 KF-205	App. I-6 App. I-9 TF-220.8
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(e) Care of welding materials, including flux, in the work areas.

_____	App. A-302.4 App. A-302.7	App. F-202.7	App. 10-6 App. 10-9	6.2.3.1	App. 2-117 KF-205	App. I-6 App. I-9 TF-220.8
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(f) Permissible ambient conditions during welding.

_____	PW-1.2.2	_____	UW-30	6.2.3.2	App. 2-117 KF-206	TF-220.8
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6.2.10 Nondestructive Examination

NDE documentation:

(a) Are written procedures or shooting sketches provided?

Part 3, 4.2 a)	App. A-302.8 PW-11 PW-51 PW-52 B31.1, 136.4.2	_____	App. 6-1 App. 8-1 App. 10-10 App. 12-1 UW-51	Annex 2.E.10 7.5.3 7.5.4 7.5.5 7.5.6 7.5.7 7.5.8	App. 2-118 KE-105	App. I-10 TE-110.2 App. IV TE-110.3 App. IX TE-110.4 App. V TE-110.5 App. VI
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(b) Are personnel qualifications for RT and UT examiners documented in accordance with the Manufacturer's Written Practice per requirements of SNT-TC-1A, CP-189, or ACCP (current Code-accepted Edition)?

Part 3, 4.2 b)	App. A-302.8 App. A-360 PW-50 Note 5	_____	App. 10-10 App. 12-2 Table U-3 UW-51 Note 5	7.5.3 7.5.4 Note 5	App. 2-118 KE-111 KE-112 Note 5	App. I-10 TE-120.2 Note 5 App. IX
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- (c) Are personnel qualifications for MT, PT, and VT, as applicable, examiners certified by their Employer as qualified in techniques and interpretation or documented to SNT-TC-1A, CP-189, or ACCP (current Code-accepted Edition)? Are annual visual examinations on file?

Part 3, 4.2 b)	App. A-302.8 App. A-260 App. A-270 PG-25.2.1.2.1 PG-25.2.1.2.2 PW-50	_____	App. 6 App. 8	7.5.6 7.5.7 7.5.2	App. 2-118 KE-111 KE-112	App. I-10 App. V App. VI TE-120.2
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- (d) Qualification of NDE personnel for ASME B31.1 as applied to boiler external piping.

Part 3, 4.2 b)	B31.1, Chapter VI, paragraph 136.3.2 (A) thru (E) Sect. V, Article 1 T-120 SNT-TC-1A AWS-QC1	_____	_____	_____	_____	_____
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- (e) Does the Quality System Manual address methods of meeting Section I examination requirements?
(1) Are the supplemental methods of Section V Article 9 being used?

_____	PG-75	_____	_____	_____	_____	_____
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6.2.11 Heat Treatment

- (a) Controls in-plant or subcontracted heat treatment as described in the text of the Quality System Manual.

Part 3, 1.5.1 h) Part 3, 1.5.1 k) Part 3, 2.5.2	App. A-302.9	_____	App. 10-11	Annex 2.E.11 2.3.7 7.3.3	App. 2-119 KG-412 KG-420	App. I-11 Article TF-7 TG-320
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- (b) Are contact-type thermocouples used, or is soak-band method used?

Part 3, 2.5.2	_____	_____	UW-49	6.4.3	KF-411	TF-700
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- (c) Are procedures or instructions available to the operator?

Part 3, 1.5.1 k) Part 3, 2.5.2 a)	App. A-302.9	_____	App. 10-11	Annex 2.E.11 2.3.7	KG-420	App. I-11 Article TF-7
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(d) Does the Certificate Holder exercise control over subcontracted heat treatment? Are time and temperature records required or obtained?

Part 3, 1.5.1 h) Part 3, 1.5.1 k)	App. A-302.9	—	App. 10-11	Annex 2.E.11 2.3.7	App. 2-119 KG-420	App. I-1 Article TF-7 TG-320 TG-320.2 TM-140.2
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(e) Traceability of material and parts and identification upon return from subcontractor's facility.

Part 3, 1.5.1 h) Part 3, 1.5.1 k)	App. A-302.9	—	App. 10-11	Annex 2.E.11 2.3.7	KF-112.3 KG-414	App. I-11 TG-320 TM-140.1 TM-140.2 TM-140.3
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(f) Are heat treatment records made available to the Inspector?

Part 3, 1.5.1 h) Part 3, 1.5.1 k)	App. A-302.9	—	App. 10-11	Annex 2.E.15 6.4.2.5	App. 2-119 KF-414	App. I-1 App. I-11 App. I-15 TG-330
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(g) Heat treatment that might affect vessel stress redistribution.

—	PG-19 PW-39	—	UCS-56 UCS-79 UHA-51 UNF-79	—	KF-412 KF-540 KG-323(d)	—
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(h) Postweld heat treatment after repairs.

Part 3, 1.5.1 h) Part 3, 1.5.1 k) Part 3, 2.5.2	PW-2.5.2.1.4 PW-40	—	UW-40	6.1.1.3 6.4.5	KF-420 KF-540	App. I11 TF-110.3 Article TF-7 TF-710
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6.2.12 Calibration

(a) Method of recordkeeping, (i.e., cards, labels, and equipment identification.)

Part 3, 1.5.1 m) Part 3, 4.3	App. A-302.10 App. A-302.11 App. A-302.12	App. F-202.8 Note 7	App. 10-12 App. 10-13 App. 10-14	Annex 2.E.12	App. 2-120 App. 2-121 Note 7 Note 8	App. I-1 App. I-12 App. I-14 Note 7 Note 8
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(b) Is the program in use described in the QC Manual?

Part 3, 1.5.1 m)	App. A-302.10	App. F-202.8	App. 10-12	Annex 2.E.12	App. 2-120 KG-414 KG-420	App. I-1 App. I-12 App. I-14
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6.2.13 Record Retention

(a) Verify records, (i.e., *Manufacturer's Data Reports*, test records, etc.), as required by the Code.

Part 3, 1.5.1 t) Part 3, Table 1.5.1	App. A-302.11 PB-29.3 PEB-18.5.1 PG-105.1 PG-105.3 PG-73(c) PG-73(b)(6) PG-73.6.3(b) PG-113.3 PW-28.4 PW-50 PW-51.4 PW-52.2	App. F-100 HA-203 HA-404 HA-502.10 HC-215 HC-403 HC-502.10 HG-520.1 HLW-504 HLW-601	App. 10-13 UG-117	Annex 2.C.3 Annex 2.E.13	App. 2-121 KS-320	App. I-13 TE-110.2 TG-320 TS-300 TS-310
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(b) Additional Requirements Section VIII, Divisions 2 and 3:

- (1) User's Design Specification (certified) and *Manufacturer's Data Report* (certified) plus examination, fabrication, and repair records on file in a safe storage facility. See 2.16.2 and 2.16.3 of this Guide for a listing of required records under Section VIII, Divisions 2 and 3.

Part 3, 3.3.5.2 Part 3, 3.4.4.1	_____	_____	_____	Annex 2.C.3	KG-311 KG-324 KG-325	_____
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- (2) Construction records furnished to the owner when the *Manufacturer's Data Report* is certified.

_____	_____	_____	_____	Annex 2.C.3	KG-325 KS-320	_____
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(c) Are nameplate data and stamping as required by the applicable Code section and division?

Part 3, 1.3.2 c) Part 3, 5.7	PEB-18	HG-530	UCD-115	Annex 2.F	Article KS-1	TS-100 TS-130
	PFH-1.5	HG-531	UCI-115			
	PG-106	HG-532	UCL-55			
	PG-108	HG-533	UG-115			
	PG-109	HLW-602	UG-116			
	PG-111		UG-118			
	PMB-1		UG-119			
			UHA-60			
			UHT-115			
			ULT-115 ULW-115			

(d) Obtain most recent National Board registration number and date used. Code items produced per year and number of these registered.

—	Note 13 Note 9					
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6.3 Duties of the Inspector

(a) Listed herein are Code-specified duties of the Inspector. Some of these duties are applicable to all types of Code fabrication while others may be applicable only to special types of construction. Some require only periodic checks, such as date of Certificate expiration, completeness of welding documentation, NDE procedures, etc. In various matters the Code sections allow the Inspector to accept the Certificate Holder's documentation as proof of the Code Compliance, e.g., heat treatment. As defined in the applicable Code of Construction, the Inspector could be an Authorized Inspector, Qualified Inspector, or Certified Individual. The user of this Guide must ensure that the correct Inspector is identified. By Code rules, in addition to the mandatory inspections, the Inspector has the prerogative of selecting and designating additional inspections to perform prior to start of fabrication. The Inspector has the Code duty of performing all inspections mandated by the applicable Code section, plus such other inspections to be satisfied that all requirements of the Code have been fulfilled.

(b) All inspections the Inspector performs should be signed (or initialed) and dated on the traveler, process sheet, or checklist. Such signatures constitute evidence of required Inspector's participation in the Certificate Holder's Quality Management System through various phases of fabrication.

6.3.1 Authorization

Verify the Manufacturer or Installer has a valid *Certificate of Authorization* and is working to a Quality Management System.

Part 3, 1.5	A-302.13	App. F	App. 10	Annex 2.E	App. 2-100	TG-330(a) Note 9
	PG-90	HG-515.3	UG-90(c)(1)(a)	2.4.3.1	KG-440	
	Note 9	Note 9	Note 9	Note 9		

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6.3.2 Design

- (a) Drawings and design calculations have been produced and are available for review by the Inspector.

Part 3, 1.5.1 g) Part 3, 1.5.1 o) Part 3, 3.2.4 Part 3, 3.2.5	App. A-302.13 PG-90.3	App. F-202.10.2.2 HG-515.2	App. 10-5 App. 10-15 U-2 UG-90	Annex 2.E.15.4 Annex 7.A.3.2 Table 7.A.1 2.2.2	App. 2-123 KG-323 KG-414 KG-440	App. I-5 TG-330(b)
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- (b) The Inspector has the duty to review selected design calculations.

Part 3, 1.5.1 o) Part 3, 3.2.4 Part 3, 3.2.5	App. A-302.13 PG-90.1.4 PG-90.3	HG-515.3	App. 10-15 UG-90	Annex 7.A.3.2 Table 7.A.1 2.4.3.2	_____	_____
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- (c) Additional Requirements for Section VIII, Divisions 1, 2, and 3:

- (1) The Inspector shall ensure that the User's Design Requirement Form (VIII-1), when applicable, the User's Design Specification (VIII-2/3) and the *Manufacturer's Design Report* (VIII-2/3) are on file and that these documents have been certified by either a Certifying Engineer, engineer, or designer as applicable, experienced in vessel design, and are maintained as required by Code.

Part 3, 3.3.5.2 Part 3, 3.4	_____	_____	U-2 (a)(2)(-a)	2.4.3.2	KG-311.14 KG-324 KG-325 KG-414 KG-440 KS-320	_____
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- (2) The Inspector shall ensure personnel engaged in design activity are qualified in accordance with the Code and the Quality Control System.

Part 3, 3.3.5.2 Part 3, 3.4	_____	_____	UG-91 (b)	2-J.1 a) 2.4.3.2	KG-311.14 KG-324 KG-440 (m)	_____
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- (3) The Inspector shall ensure that the Designer is an individual engineer, or group of engineers, who are experienced in high-pressure vessel design, and who perform the required analysis of the vessel.

_____	_____	_____	_____	_____	KG-330	_____
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6.3.3 Materials

- (a) The Inspector shall ensure that materials used in Code construction are materials allowed by the applicable Code section and division.

Part 3, 1.5.1 i) Part 3, 3.2.1	App. A-302.13 PG-5 PG-6 PG-7 PG-8 PG-9 PG-90 Note 9	App. F-202.10 HF-201 thru 204 HG-515.3 HLW-201 HLW-203 HLW-600.3 Note 9	App. 10-15 UG-4 thru UG-9 UG-93 Note 9	2.4.3 Note 9	App. 2-114 App 2-123 KF-111 KF-112 KG-414 KG-440 KM-101 Note 9	App. I-6 TG-330(c) Note 9
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- (b) The Inspector shall examine *Material Test Reports* (certifications) to ensure compliance with material specification.

_____	App. A-302.13 Note 9	App. F-202.10 HF-201 HG-515.3 HLW-201 HLW-600.3 Note 9	App. 10-15 UG-93 Note 9	Annex 2.E.15 Annex 7.A.3.2 Table 7.A.1 2.4.3 3.2.5 3.2.6 Note 9	App. 2-123 KG-414 KG-440 Note 9	TG-330 TM-140.1(a)(1) Note 9
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- (c) The Inspector shall ensure that the material bears material Manufacturer's markings.

Part 3, 3.2.1 a)	App. A-302.13 PG-77 Note 9	App. F-202.10 HF-210 HLW-201 Note 9	App. 10-15 UG-77 UG-93 UG-94 Note 9	Annex 2.E.15 Annex 7.A.3.2 3.2.7 Table 7.A.1 Note 9	App. 2-123 KG-414 KG-440 Note 9	App. I-6 TG-330 TM-140.3 Note 9
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- (d) Cast, rolled, forged, or die-formed standard pressure parts shall be marked traceable to listings available for examination by and acceptance to the Inspector.

Part 3, 3.2.2 a)	PG-11.1	HF-203.1 HLW-203	UG-11	3.2.8.2	KM-102.1 KM-102.2 KM-102	TM-110.10(a)
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- (e) The Inspector may accept material not identified with a specification permitted by the Code division, provided each piece is chemically and physically tested, and such tests are acceptable to the Inspector.

Part 3, 3.2.1 a)	PG-10 Note 15	HF-205 HLW-202 Note 15	UG-10 Note 15	_____	_____	TM-120 Note 15
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- (f) The Inspector may accept materials not produced to a specification permitted by this division, provided the initial certification by the material Manufacturer states that the requirements of the designated specification are satisfied.

Part 3, 3.2.2 d), e)	PG-10 Note 15	HF-206 Note 15	UG-10 Note 15			TM-120 Note 15
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- (g) Records shall be provided and made available to the Inspector when radiography is performed and radiographs examined in the plant of the parts Manufacturer.

Part 3, 1.5.1 o) Part 3, 4.4 d)	PG-11.3.3 PW-51	NA	UG-120 UW-51	Annex 7.A.3.2 Table 7.A.1	KG-414 KG-440	TE-110.2
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6.3.4 Welding

- (a) The Inspector shall ensure that all welding (brazing) procedures have been qualified to the provisions of Section IX.

Part 3, 1.5.1 k) Part 3, 2.2.1	App. A-302.13 PB-1.4.2 PB-17 PW-28 PW-47.1 Note 9	App. F-202.10 HB-1501 HG-515.3 HLW-600.3 HW-910 Note 9	App. 10-9 UB-42 UG-90 UW-47 Note 9	Annex 7.A.3.2.6 Table 7.A.1 7.3.4 Note 9	App. 2-123 KE-212.2 KF-216 KG-414(i) KG-440(d) Note 9	App. I-9 TF-210 TG-330(d) Note 9
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- (b) It is the duty of the Inspector to ensure that welding procedures (brazing) qualification records (PQRs) are complete and have been certified by the Certificate Holder.

Part 3, 2.2.4	App. A-302.13 PB-28 PW-28 PW-47.1 Note 1 Note 9	App. F-202.10 HB-1501 HG-515.3 HLW-600.3 HW-910 Note 1 Note 9 App. 7-400	UB-42 UW-26 UW-28 UW-47 Note 1 Note 9	Annex 7.A.3.2.6 Table 7.A.1 7.3.4 Note 1 Note 9	KF-211 KF-214 KF-216 KG-414(i) KG-440(d) Note 1 Note 9	App. I-9 TF-210 Note 1 Note 9
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- (c) The Inspector shall verify design test date for all brazed joints designed to operate above 200°F.

			UB-12 UB-14			
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6.3.5 Welders and Welding Operators

- (a) It is the duty of the Inspector to ensure that all welders (brazers) and welding operators (brazing operators) are qualified per Section IX, and that only personnel so qualified perform Code work.

Part 3, 1.5.1 k) Part 3, 2.2	App. A-302.13 PB-29 PG-90.1.9 PW-48.1 Note 9	App. F-202.10 HB-1502 HG-515.3 HLW-600.3 HW-911 App. 7-400 Note 9	App. 10-9 UB-32 UG-90 UW-29 UW-48 Note 9	Annex 7.A.3.2.6 7.3.5 Note 9	App. 2-117 KF-216 KF-238(b)(1) KG-414(j) KG-440(e) Note 9	App. I-9 TF-210 TG-330(e) Note 9
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- (b) It is the duty of the Inspector to ensure that welding (brazing) performance qualification records are complete and have been certified by the Certificate Holder.

Part 3, 1.5.1 k) Part 3, 2.2.4	App. A-302.13 PB-28 PG-90.1.9 PW-28 PW-47.1 PW-48.1 Note 1 Note 9	App. F-202.10 HB-1502 HG-515.3 HLW-600.3 HW-911 App. 7-400 Note 1 Note 9	UB-43 UG-90 UW-28 UW-29 UW-48 Note 1 Note 9	Annex 7.A.3.2.6 Note 1 Note 9	KF-211 KF-214 KF-216 Note 1 Note 9	App. I-9 TF-210 TG-330(d) Note 1 Note 9
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- (c) The Inspector may require requalification of welders (brazers) and welding (brazing) operators if there is specific reason to question their performances.

Part 3, 2.2.6 b)	PB-48.2 PW-48.2	_____	UB-43 UW-48	Annex 7.A.3.2.6	_____	_____
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- (d) It is the inspection agency's duty, when the Certificate Holder hires welders who are not in the employ of the Certificate Holder, to accept the program.

Part 3, 1.5.1	PW-1.2.4	_____	UW-28	2.3.7.4	_____	_____
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6.3.6 Postweld Heat Treatment

The Inspector shall verify that all postweld heat treatment has been correctly performed and that the temperature reading conforms to the requirements.

Part 3, 1.5.1 h) Part 3, 2.5.2	App. A-302.9 App. A-302.12 PW-49 Note 9	_____	App. 10-11 UF-52 UG-90 UW-46 UW-49 Note 9	Annex 7.A.3.2.5 7.3.3 Note 9	App. 2-119 App. 2-123 KG-414(m) KG-420 KG-440(f) Note 9	App. I-11 Article TF-7 TG-330(f) Note 9
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6.3.7 Welded Repairs

Defects in material may be repaired by welding, provided concurrence is first obtained from the Inspector for method and extent of the repair. Items found nonconforming in production shall be repaired in a manner agreed upon between the Inspector and the Manufacturer.

Part 3, 1.5.1 j)	App. A-302.6 PG-78	App. F-202.6 HG-515 HG-515.3(3) & (9)	App. 10-8 App. 10-15 UF-37 UF-38 UG-78 UG-90 UW-51 UW-52	6.4.5.2(c) 6.4.6.4(c)(1) 7.2.3	App. 2-116 App. 2-117 App. 2-123 KE-212 KE-213 KE-214 KE-223 KE-234 KE-266 KF-113 KF-243 KF-712	App. I-8 App. I-9 TF-110.3 TG-330(g)
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6.3.8 Nondestructive Examination

- (a) The Inspector shall verify that required nondestructive examinations (NDEs) have been performed by qualified personnel, meet code requirements and the results are properly documented.

Part 3, 1.5.1 l) Part 3, 1.5.1 o) Part 3, 4.2	App. A-302.13 PW-11 PW-50 Note 9		App. 10-10 App. 6 App. 8 App. 12 UG-90 UW-50 UW-51 UW-53 Note 9	Annex 7.A.3.2.6 Note 9	App. 2-118 KG-414(n) KG-440(h) Note 9	App. I-10 TG-330(i) Note 9
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- (b) The Inspector has the right to require proof of NDE examiner's ability to perform and interpret results of examinations.

Part 3, 4.2 b) Part 3, 4.4 d)	PG-25 PW-50 Note 9		App. 6 App. 8 App. 12 UW-51 UW-52 UW-53 Note 9	Annex 7.A.3.2.6 Note 9	KE-105 Note 9	TE-110.1 Note 9
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- (c) Radiograph film and all NDE reports shall be available to the Inspector for review.

Part 3, 4.4 d)	App. A-302.13 Note 6		App. 10-15 Note 6	Annex 7.A.3.2.6 Note 6	App. 2-123 KG-325 KS-320 Note 6	App. I-15 Note 6 TE-110.2
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6.3.9 Material Identification

- (a) The Inspector shall confirm that material identification numbers have been properly transferred before or after cutting the material into two or more pieces.

Part 3, 1.5.1 i) Part 3, 3.2.1	PG-77.2 Note 9	HF-210 HLW-201 Note 9	UG-77(a) UG-90 UG-94 Note 9	Annex 7.A.3.2 Note 9	KF-112 KF-601 KG-414(e)(4) KG-440(i) Note 9	TF-110.2 TM-140.3 Note 9
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- (b) Vessel plates shall be marked or identified on the completed vessel, or markings shall be recorded to the satisfaction of the Inspector.

Part 3, 1.5.1 i) Part 3, 3.2.1	PG-77	HF-210 HLW-201	UG-77 UG-90	Annex 7.A.3.2	KF-112	TF-110.2 TG-330
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6.3.10 Inspections During Construction

- (a) Each item designated to be Code-stamped and documented shall be inspected during construction and after completion and, at the option of the Inspector, at such other stages of work as the Inspector may designate.

Part 3, 1.5.1 g)	PG-90 Note 9	HG-515.4 HG-533.3 HLW-600.3 Note 9	U-2 UG-90 Note 9	Annex 7.A.3.2.1 7.2.3 7.6 Note 9	KG-414 KG-440 Note 9	TG-330 Note 9 App. I-7
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- (b) The Manufacturer or installer shall submit vessels or parts for inspection at such time as the Inspector may designate.

—	App. A-302.13 PEB-18.1 PG-90 PW-46.2	App. F-202.10 HG-515.2 HLW-600.2 HW-900	UG-90	7.2.3	KG-413.2	TG-330 TG-420 App. I-7
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- (c) Identification to permit traceability of production welds to the welder or brazer, or welding or UB-32 brazing operator, shall be done in a manner acceptable to the Inspector.

Part 3, 2.2.5	PB-29.3 PW-28.4 Note 9	HB-1202.4 HW-613 Note 9	UB-32 UG-90 UW-29 UW-37 Note 9	6.2.2 Note 9	KF-238 Note 9	TF-210 TF-210.1 TF-210.3 TF-220.7 TG-330 Note 9
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- (d) The Inspector shall ensure that head and shell sections conform to required shapes and thicknesses and that dimensional requirements have been met.

—	PG-80 PG-81	HG-515 HW-800 HW-812 HW-813	UG-79 UG-80 UG-81 UG-90 UG-96	Annex 7.A.3.2.4	KF-120 KF-130 KF-234 KG-414(h)	TF-120 TF-220 TG-330
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- (e) The Inspector shall ensure that nozzles, manways, frames, reinforcement pads, and appurtenances fit properly.

—	PG-37.4 PW-33 PW-34	HG-515	UG-90	Annex 7.A.3.2.4	KF-121.3 KF-222 KF-233 KF-234 KG-414(k)	TF-120.4 TG-330
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- (f) The Manufacturer shall furnish formed templates, if requested by the Inspector.

—	—	—	UG-90 UG-96	Annex 7.A.3.2.4(b)	—	—
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- (g) The Inspector shall witness final pressure (hydrostatic or pneumatic) in the shop or at the field site.

Part 3, 4.4 d)	PEB-18.1 PG-90.1.13 PG-99 Note 9	HG-510 HG-515.3 HLW-505 HLW-600.3 Note 9	UG-90 UG-99 Note 9	Annex 7.A.3.2.7 Note 9	Article KT-3 KG-440(j) Note 9	TT-210 TT-120.5 TG-330(k) Note 9
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- (h) The Inspector shall witness proof tests or deformation test of vessels or parts.

Part 3, 4.4 d)	App. A-22.10 PG-100	HG-506 HG-515 HLW-504 Table 4-1(29) App. 5-500	UG-90 UG-101	—	—	TT-300
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- (i) The Inspector shall witness examinations of all high-stress areas, joints, and connections following final pressure tests.

—	—	—	UG-99	7.6.1	KG-440(j) KT-330	TT-210
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- (j) For Inspector duties under a multiple-duplicate program (full-time resident Inspector).

—	—	HG-515.4(b) App. 7	UG-90(c)(2)	—	—	TS-200.7
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6.3.11 Stamping of the Code Symbol Stamp

(a) Markings and Nameplates;

(1) The Inspector shall verify that required markings, including Code stamping, is provided and that the proper nameplate (if used) is permanently attached to the vessel or part.

Part 3, 5.7.1	PG-106.1 PG-106.5 PG-106.7 PG-107.1.3 PG-108.2 Note 9	HG-515.3 HG-533 HLW-602 Note 9	UG-90 UG-116 UG-118 UG-119 Note 9	Annex 2.F Note 9	KG-440(k) KS-100 KS-120 KS-130 KS-140 Note 9	TG-330 TS-100 TS-100.1 TS-100.2 TS-130.3 Note 9
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(2) Method of nameplate marking or stamping.

Part 3, 5.7.5	PB-51 PEB-18 PG-106 PG-109.2	HB-1510 HG-515 HG-530 HLW-602	UB-55 UG-116 UG-118 UG-119	Annex 2.F	KG-414(k) KS-100 KS-130.1 KS-130.2	TS-100
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(3) Attachment of nameplates.

Part 3, 5.7.5 g)	PG-106 PG-107 PG-108 PG-109.2	HB-1510 HG-530 HLW-602	UG-119	Annex 2.F	KS-130.1 KS-130.3 KS-130.4 KS-140	TS-130.1
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(4) Marking of multiple-chamber vessels.

—	—	—	UG-116	Annex 2.F	KS-101	TS-100.1
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(5) Marking of welded layered vessels.

—	—	—	ULW-115	Annex 2.F.1	KS-100 Figure KS-100	—
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(6) Marking of integrally forged vessels.

—	—	—	UF-115	Annex 2.F.1	KS-100 Figure KS-100	—
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(7) Marking of quenched and tempered steel vessels.

—	—	—	—	6.6.10	KF-650 KS-100 Figure KS-100	—
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(8) Marking of vessels for low-temperature service.

—	—	—	ULT-115	—	KS-100 Figure KS-100	—
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(9) Marking of wire-bound vessels.

—	—	—	ULT-115	—	KS-100 Figure KS-100	—
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(10) Marking of strip wound.

—	—	—	ULT-115	—	KS-100 Figure KS-100	—
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(11) Marking of pre-stressed (autofrettaged or shrink fitted) pressure vessels.

—	—	—	—	—	KF-550 KS-100 Figure KS-100	—
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(12) Marking of boiler or pressure vessel parts.

—	PG-106.8 PG-109.3	HG-531 HG-532 HG-534	UG-116	Annex 2.F	KS-120	TS-110
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(13) Marking extent of radiography.

—	—	—	UG-116	—	—	TS-100
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(14) Marking extent of heat treatment.

—	—	—	UG-120	Annex 2.F.1	KS-100 Figure KS-100	TS-100
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(15) Stamping of boiler power piping.

—	PG-109	—	—	—	—	—
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(16) Stamping of boiler feedwater heaters (“U”-Designator).

—	PFH-1.5	—	—	—	—	—
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(17) Application of Certification Mark of field assemblies.

—	PG-107 PG-108	HG-533	U-2 UG-90 UG-117 UG-118 UG-119	1.2.6	KS-110	—
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- (b) Certification Mark stamping shall be applied only with concurrence, or when required with the approval and witness of the Inspector, as applicable.

Part 3, 5.7.2	PG-106.5 PG-106.7 PG-108.2 Note 9	HG-515.3 HG-530.1 HG-532 HLW-602 Note 9	UG-90 UG-116 Note 9	Annex 2.F Note 9	KS-110 Note 9	TS-120 Note 9
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- (c) The Certification Mark shall only be stamped in the presence of the Inspector.

_____	PG-106.1	_____	_____	_____	_____	_____
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6.3.12 Manufacturer's Data Reports

- (a) The Inspector may sign the *Certificate of Inspection* block on the *Manufacturer's Data Report* when the vessel is complete and in full compliance with the applicable Code section and division.

_____	PFH-1.6 PG-104.2 PG-112 PG-113 PW-1.2.5 Note 9	HG-515.3 HG-532 HG-533 HLW-601 App. 7-400 Note 9	UG-90 UG-120 Note 9	Annex 2.D 2.4.3.4 Note 9	KS-300(a) KS-301 KS-302 Note 9	TS-300 Note 9
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- (b) A *Manufacturer's Data Report* of the appropriate form is required for each Code-stamped item.

_____	PG-104 PG-112	HG-520 HLW-601 HG-515.2	UG-120	Annex 2.D	KS-300	TS-300
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- (c) Preparation of *Manufacturer's Data Report* for guidance.

_____	App. A-350 PG-112 PG-113	App. 4 HG-520 HLW-601	App. W	Annex 2.D	App. A KS-300	App. C TS-300
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- (d) Additional requirements of entries on *Manufacturer's Data Report* forms for:

- (1) welded layered vessels;

_____	_____	_____	ULW-115	Annex 2.D	KS-300	_____
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- (2) integrally forged vessels;

_____	_____	_____	UF-115	6.7.11.2	KS-300	_____
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(3) clad or lined vessels;

—	—	—	ULT-115	Annex 2.C.1.2 6.5.9	KS-300	—
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(4) low-temperature service vessels;

—	—	—	ULT-115	—	KS-300	—
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(5) multiple-duplicate vessels or boilers;

—	—	HG-515.4(b)	UG-90(c)(2)	—	—	TS-200.7
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(6) field assemblies;

—	PG-107 PG-113	HG-532 HG-533 App. 7-500	U-2 UG-117	1.2.6	KS-300	—
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(7) exemption of inspection openings;

—	—	—	UG-46	4.5.16.2	—	—
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(8) noncorrosive service;

—	—	—	UG-46(a)(4)	4.5.16.2	—	—
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(9) forged vessels;

—	—	—	—	6.7.11.2	KF-650 KS-300	—
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(10) pre-stressed (autofrettaged, or shrink fitted) pressure vessels;

—	—	—	—	—	KF-550 KS-300	—
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(11) identification of openings; and

—	App. A-350	App. 4	App. W	Annex 2.D	App. A	App. C
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(12) exemption of Charpy impact testing.

—	—	—	UCS-66 UCS-67 UG-20(f)	3.11	—	TM-210 TM-240 TM-250
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(13) design requirements of the User's Design Requirements Form (or equivalent) are specified.

—	—	—	U-2(a)(2)(-a)	—	—	—
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(14) methods of design used not covered by Code rules.

—	—	—	U-2 (b)(4)	—	—	—
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6.4 Duties of the Certified Individual (CI) for Sections I; IV; VIII Divisions 1 and 3; and XII Only

- (a) As provided by the respective Code sections, the Manufacturer is responsible for qualifying and certifying the CI to perform the inspection requirements during fabrication that are normally performed by an Inspector.
- (b) The Manufacturer is responsible for oversight of the CI during their activities. To ensure compliance, the Authorized Inspection Agency provides oversight during the required annual audits, except CIs that provide inspections for Section IV, HC, and HA requirements of the Manufacturer's Quality Management System.
- (c) Listed herein are the Code-specified duties of the CI. Some of the duties are applicable to the types of Code fabrication the respective Code section permits the Manufacturer to use, the services of their inspection staff to fulfill certain requirements, and still enable the Manufacturer to produce Code products and satisfy the certification and stamping requirements.
- (d) By Code rules, in addition to the mandatory inspections, the CI has the prerogative of selecting and designating additional inspections they wish to perform prior to the start of fabrication. The CI has the Code duty of performing all inspections that are normally performed by the Authorized Inspector that are mandated by the applicable Code requirements, plus such other inspections as they may require to be satisfied that all Code requirements of the applicable Code section (Sections I; IV; VIII, Division 1; and XII) have been fulfilled.
- (e) All inspections performed by the CI shall be signed (or initialed) and dated on a traveler, process sheet, or checklist. Such signatures constitute evidence of the CI participation in the Manufacturer's Quality Management System through various phases of fabrication.

6.4.1 Certification

The Manufacturer or Assembler has a valid *Certificate of Authorization*, i.e., Section I (PEB); Section IV (HC); Section VIII, Division 1 (U-2); Section VIII, Division 3 (KR); and Section XII (Class 3), and the Manufacturer is working to a Quality System Manual that has been accepted by the Authorized Inspection Agency [except for Section IV (HC and HA)]. Under Section IV (HC and HA), the Quality System Manual shall be approved by ASME. Any changes in ownership, company name, or location must be promptly reported to the director of accreditation of the ASME by letter.

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6.4.2 Review and Acceptance

Drawings, design calculations, and operating procedures have been produced, reviewed, and accepted by the Authorized Inspection Agency of record. This review is also subject to evaluation by the Inspector.

PG-105.4	HA-404	UG-117(g)	KR-410(b) (SRV only)	App. I-16 TG-300 TG-410 TG-430
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6.4.3 Materials in Compliance

(a) The CI shall ensure that materials used in Code Construction are materials allowed by Code Section and Division.

PG-5 PG-90.1.6	HA-502.12.2 HC-502.12.2	App. 10-15 UG-4 thru UG-9 UG-93	KR-410(b) (SRV only)	TG-330 TG-410
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(b) The CI shall examine *Material Test Reports* (certifications) to ensure compliance with the applicable Material Specification(s).

PG-5	HA-502.12.2 HC-502.12.2	App. 10-5 UG-93	KR-410(b)	TG-330
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(c) The CI shall ensure that the material bears the material Manufacturer's markings.

PG-77 PG-90.1.7	App. F-202.4 HA-502.12 HC-502.12	App. 10-5 UG-93	_____	TG-330
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(d) Cast, rolled, or die-formed standard pressure parts shall be marked traceable to listings available for examination by and acceptance to the CI.

App. A-302.13 PG-11.1	HA-502.12 HC-502.12	App. 10-5 UG-11	_____	TM-110.10(a)
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(e) If accepted by the Authorized Inspection Agency, and specified in the applicable accepted operating procedures, the CI may accept material not identified with a specification permitted by the Code Division, provided each piece is chemically and physically tested and such tests are acceptable to the CI, and when required by the Authorized Inspection Agency.

PG-10 Note 15	HA-502.12 HC-502.12 HC-502.12.2	UG-10	_____	TM-120
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- (f) If accepted by the AIA and specified in the applicable accepted operating procedures, the CI may accept materials not produced to a specification permitted by the applicable division of the Code, provided the initial certification by the material Manufacturer states that the requirements of the designated specification are satisfied.

PG-10 Note 15	HA-502.12 HC-502.12	UG-10 Note 15	—	TM-120
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- (g) If accepted by the AIA, and specified in the applicable accepted operating procedures, the CI certifying piping shall determine that the pipe complies with Section I requirements. If this operation is implemented, the CI shall notify the AIA, or the applicable AI, for review and verification.

PG-9	—	—	—	—
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6.4.4 Welding in Compliance

- (a) If accepted by the AIA, and specified in the accepted applicable operating procedures, the CI shall ensure that all welding (brazing) procedures have been qualified to the provisions of Section IX. If this operation is implemented, the CI shall notify the AIA, or the applicable AI, for review and verification.

App. A-302.13 PB-1.4.2 PB-17 PB-47 PW-28 PW-47.1	HA-201	App. 10-9 UB-42 UG-90 UW-47	—	TF-210.2
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- (b) If accepted by the AIA and specified in the applicable accepted operating procedures, it is the duty of the CI to ensure that welding (brazing) performance qualifications records are complete and have been certified by the Manufacturer. If this operation is implemented, the CI shall notify the AIA, or the applicable AI, for review and verification.

App. A-302.13 PB-48 PW-28 PW-47.1 Note 1 Note 9	Welding is not permitted by HC-514(c) Welding is permitted by HA but there is no AIA HA-201 (WPS, PQR & WPQ required) – in Quality System	UB-43 UG-90 UW-28 UW-29 UW-48 Note 1	—	TF-210(c)
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- (c) If accepted by the AIA, and specified in the applicable operating procedure, the CI has the duty and responsibility to ensure impregnation of castings is addressed in the QC Manual and accomplished in accordance with MIL-STD-276.

	Permitted by HA-201, no AIA involvement			
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- (d) If accepted by the AIA, and specified in the applicable operating procedures, the CI may require requalification of welding procedures if the CI has specific reason to question the applicability of the welding procedure. If this operation is implemented, the CI shall notify the AIA, or the applicable AI, for review and verification.

PB-47.1 PW-47.2		UG-42 UW-48		
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- (e) If accepted by the AIA, and specified in the applicable operation procedures, the CI shall verify design test data for all brazed joints designed to operate above 200°F. If this procedure is implemented, the CI shall notify the AIA, or applicable AI, for review and verification.

		UB-12 UB-41		
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6.4.5 Duty and Responsibility

- (a) If accepted by the AIA, and specified in the applicable operating procedures, the CI has the duty and responsibility to ensure that all welders (brazers) and welding (brazing) operators are qualified per Section IX, and that only personnel so qualified perform Code work.

App. A-302.13 PB-29 PW-48.1	Welding is not permitted by HC-214(c) Welding is permitted by HA but there is no AIA HA-201(WPS, PQR & WPQ required) – in Quality System	App. 10-9 UB-30 UG-90 UW-48		TF-210(b) TF-200(g)
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- (b) If accepted by the AIA, and specified in the applicable operating procedure, the CI has the duty and responsibility to ensure that welding (brazing) performance qualification records are completed and have been certified by the Manufacturer.

App. A-302.13 PB-28 PW-28 PW-48.1 Note 1	Welding is not permitted by HC-214(c) Welding is permitted by HA but there is no AIA HA-201(WPS, PQR & WPQ required) – in Quality System	UB-43 UG-90 UW-28 UW-29 UW-48 Note 1		TF-200
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- (c) If accepted by the AIA and specified in the applicable accepted operating procedure, the CI may require requalification of welders (brazers) and welding (brazing) operators if the CI has specific reason to question their performance. If this operation is implemented, the Certified Individual must notify the AIA, or the applicable AI, for review and verification.

PB-48.2 PW-48.2	_____	UB-43 UW-48	_____	_____
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6.4.6 Defects

Minor defects in material may be repaired by welding, provided the CI follows the procedure established by the AIA. The procedure, as a minimum, shall establish criteria for method and the extent of the repair activity. The CI is not permitted to exceed or modify the accepted repair method. Items found nonconforming in production shall be repaired in a manner agreed upon between the AIA, or the AI and Manufacturer. The CI shall record the items found nonconforming and these records shall be made available to the AIA.

App. A-302.6 PB-33	Welded repairs are not permitted on HC boilers HA-201	App. 10 UF-37 UF-38 UG-78 UG-90	_____	TF-110.3
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6.4.7 Identification

- (a) The CI shall confirm that material identification numbers have been properly transferred before or after cutting the material into two or more pieces. The CI shall verify that the Manufacturer's Quality Management System has provided for transfer of material identification after cutting. This procedure, if used, shall be acceptable to the AIA.

PG-77.2	HA-502.12 HC-502.12	UG-77(a) UG-90 UG-94	_____	TF-110.2
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- (b) Vessel plates shall be marked or identified on the completed vessel, or markings shall be recorded to the satisfaction of the AIA.

_____	_____	UG-77(a) UG-90	_____	TF-110.2
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6.4.8 Inspection

- (a) Each item designated to be Code stamped and documented on a *Manufacturer's Data Report*, shall be inspected during construction and after completion and, at the option of the AIA or ASME (Section IV, HC and HA), at such stages of work as the applicable entity may designate.

PEB-18 PG-90	Note: The CI certifies Forms HC-1, HC-2, HA-1 and HA-2	U-2 UG-90	KR-410(b)	TF-120.5 TG-330
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- (b) The Manufacturer or installer shall submit vessel or vessel parts for inspection at such times as the AIA may designate. All inspection activities accepted by the AIA shall be documented in the Manufacturer's Quality Management System.

App. A-302.13 PG-90.1 PEB-18.1	_____	UG-90	_____	App. I-1 App. I-16
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- (c) Identification to permit traceability to production welds to the welder or brazer, or welding or brazing operator, shall be done in a manner acceptable to the AIA.

PB-29.3 PW-28.4	_____	UB-32 UG-90 UW-29	_____	TF-210
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- (d) The CI shall satisfy themselves that casting of the head and shell sections conform to the required shape, thicknesses, and dimensional requirements.

_____	HA-502.12 HC-502.12	UG-79 UG-80 UG-81 UG-90 UG-96	_____	TF-120
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- (e) The CI shall ensure that nozzles, frames, reinforcement parts, and appurtenances fit properly.

_____	_____	UG-90 UG-96	_____	_____
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- (f) The Manufacturer shall furnish formed templates if requested by the CI or the AIA.

_____	_____	UG-90 UG-96	_____	_____
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- (g) The CI shall witness the final pressure test (hydrostatic or pneumatic) in the shop.

PEB-18.1 PG-90.1.13 PG-99	HA-502.12.2 HC-502.12	UG-90 UG-99	KR-410(b)	TF-120.5(d) TG-330 TT-210
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- (h) The CI shall witness examinations of all high stress areas, joints, and connections following the final pressure test.

_____	_____	UG-99	_____	TT-210
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6.4.9 Markings

- (a) The CI shall verify that the required markings, including the Certification Mark, are provided and that the proper nameplate is permanently attached to the vessel or vessel part.

PG-106	HA-502.12 HC-502.12	UG-90 UG-116 UG-118 UG-119	KR-410(b)	TS-130
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- (b) Method of marking (nameplate).

PEB-18 PG-106 PG-109	—	UG-119	KR-410(b)	TS-100
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- (c) Code-symbol stamping shall be applied only with the concurrence of the CI.

PEB-18 PG-106	—	UG-90 UG-116	KR-410(b)	TS-120
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6.4.10 Complete and in Compliance

- (a) The CI may sign the *Certificate of Inspection* block on the *Manufacturer's Data Report* when the vessel is complete and in full compliance with the applicable Code section and division.

PEB-18.5.2 PG-104	—	UG-90 UG-120	—	TS-300
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- (b) A *Manufacturer's Data Report* of the appropriate form is required for each Code stamped item.

PG-104	HG-520	UG-120	KR-410(c)	TS-300
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- (c) Preparation of *Manufacturer's Data Report* for guidance.

App. A-350 PG-112 PG-113	App. 4	App. W	App. A	App. C
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6.5 GENERAL NOTES

NOTE 1: For requirements of Certificate Holder's certification of welding (or brazing) procedure and record of welder's (or brazer's) performance qualifications: Section IX, QW-103.2, QW-200.2(c), QW-201, QB-103.2, QB-200.2(c), and QB-201.

NOTE 2: For the welder/welding operator - maintaining or renewing qualifications in welding and brazing processes: Section IX, QW-322, and QB-322. For personnel performing supervisory activities: Section IX, QG-106.

NOTE 3: Required availability of WPS and BPS to welders or brazers: Section IX, QW-200.1(a), and QB-200.1(a); and to Inspectors: Section IX, QW-200.1(e) and QB-200.1(e).

- NOTE 4:** Section II, Part C, SFA 5.02, 4.3.1 – Filler metals shall be suitably packaged to protect them from damage during shipment and storage under normal conditions. Holding oven temperature for covered electrodes, such as low-hydrogen Section II, Part C, SFA 5.1, Annex A.6.11, and Table A3 plus notes or the electrode Manufacturer’s recommendations, if more stringent.
- NOTE 5:** If the Written Practice is in accordance with SNT-TC-1A, CP-189 or ACCP, all levels of NDE examiners should be qualified by written examination. If ASME Section V, Article 1, Mandatory Appendix III is invoked, then all levels of NDE examiners shall be qualified by written examination.
- NOTE 6:** Availability of reports to Inspectors: Section V, T-291 and T-292.
- NOTE 7:** Section V of the Code contains procedures and requirements for calibration of NDE equipment.
- NOTE 8:** Referenced Code paragraphs refer to Section II, SA-370, which refers to calibration of impact test machines and semi-annual calibration of temperature measurement equipment.
- NOTE 9:** See *National Board Rules for Commissioned Inspectors*.
- NOTE 10:** The majority of North American Jurisdictions require National Board registration of boilers, pressure vessels, and in some cases, parts.
- NOTE 11:** As defined in the applicable Code of Construction, an Inspector could be an Authorized Inspector, Qualified Inspector, or Certified Individual, or as permitted in the applicable registration procedure.
- NOTE 12:** See 4.0 of this Guide for Code sections required by Certificate Holders, new and renewal.
- NOTE 13:** Preparation, issuance, distribution, retention, or registration with the National Board of *Manufacturer's Data Reports* shall comply with the requirements of the Code to which the item is constructed.
- NOTE 14:** National Board policy requires description of method of assigning National Board registration numbers to ensure that skips and gaps will not occur.
- NOTE 15:** The Inspector is guided to consider the following as applicable to the designated specification:
- a) melting method;
 - b) melting practice;
 - c) deoxidation;
 - d) quality;
 - e) condition (as-rolled, normalized, quenched, and tempered, etc.);
 - f) chemical analysis, ultimate tensile, yield, and elongation;
- NOTE:** Elongation derived using DIN standards is measured on a different proportion than ASME or ASTM specifications. Unfortunately, it is not possible to equate the two figures for elongation by using a conversion factor, because the elongation with reduction of area and equal-size elongation is different for every test piece.
- g) grain size test limits;
 - h) hardness;

- i) dimensional tolerances;
- j) marking;
- k) testing and test methods; and
- l) welded repairs made prior to recertification.

Should any requirements of the proposed Material Specification as stated by the Manufacturer fail to meet the specification, or fail to prove some requirements of the specification, the material involved shall be considered non-Code acceptable. Further, should the stamp holder attempt to state a different specification acceptance, all previous tests must be re-evaluated in terms of the newly designated specification.

NOTE 16: CA-1 Conformity Assessment Requirements.

7.0 Special Situations

Section I; Section IV; and Section VIII, Divisions 1, 2, and 3; Section X; and Section XII all contain additional requirements for some unique types of boilers, pressure vessels, or their components and parts. In all cases, these additional requirements must be complied with, in addition to the general requirements set forth in Part PG of Section I; HG of Section IV; UG of Section VIII, Div. 1; Part 1 of Section VIII, Div. 2; KG of Section VIII, Division 3; RG of Section X; and TG of Section XII. Some examples of these additional requirements are listed below.

7.1 Feedwater Heaters (Section I, Part PFH)

- (a) A feedwater heater is a heat exchanger in which boiler feedwater is heated by steam or hot water extracted from the boiler or prime mover. The following additional requirements must be considered:
 - (1) Where the feedwater heater is located within the scope of Section I, *Power Piping*, it falls under the scope of Section I rules (see PFH-1), but may be constructed in compliance with Section VIII, Division 1, subject to the following:
 - a. It shall conform to Section VIII, Division 1 rules for unfired steam boilers (UW-2).
 - b. It may NOT be constructed to Section VIII, Division 2, or Division 3 rules.
 - c. The MAWP of the primary (feedwater) side shall not be less than the design pressure requirements of ASME B31.1, paragraph 122.1.3.
 - d. The design temperature of the tubes shall not be less than the saturated steam temperature corresponding to the MAWP of the shell. If the steam entering the shell side of the feedwater heater is superheated, the design temperature of the tubes in the desuperheating zone shall be not less than the saturation temperature corresponding to the MAWP of the shell side plus 35°F (20°C).
 - e. The feedwater heater shall be stamped with the ASME “U” Code symbol stamp and documented on the ASME U-1 data report. The nameplate per UG-119 shall show the additional information “and Part PFH of Section I.”
 - f. The Section I Master *Manufacturer's Data Report* for the completed boiler unit shall indicate, “Feedwater heater constructed to Section VIII, Division 1, as permitted by Part PFH.”

7.2 Miniature Boilers (Section I, Part PMB)

- (a) Miniature boilers are defined as boilers which do not exceed the following limits (PMB-2):
- (1) 16 in. (400 mm) internal diameter of shell;
 - (2) 20 ft.² (1.9 m²) heating surface (does not apply to electric boilers);
 - (3) 5 ft.³ (0.14 m³) gross volume exclusive of casing and insulation; and
 - (4) 100 psi (700 kPa) maximum allowable working pressure.
- (b) Where any of the above limits are exceeded, the rules of power boilers shall apply. If the boiler meets the miniature classification, the rules of Part PMB shall supplement the rules for power boilers and take precedence over them in the event of conflict (PMB-2).
- (c) Materials used in construction shall conform to one of the specifications listed in Section II and shall be limited to those allowable stress values given in Tables 1A and 1B of Section II, Part D, unless specifically permitted by other applicable rules or Part PMB.
- (1) Steel plates subject to pressure shall be of pressure vessel quality and not less than 1/4 in. (6 mm) thickness, except that seamless shells shall not be less than 3/16 in. (5 mm) thickness. Heads used as tubesheets with tubes rolled in (expanded) shall be at least 5/16 in. (8 mm) in thickness.
 - (2) Boiler parts of not more than 600 in.³ (0.01 m³) in volume may be cast from copper alloy of SB-61 or SB-62 of wall thickness not less than 1/4 in. (6 mm). Such parts shall be equipped with at least one brass washout plug of not less than 1/2 in. (13 mm) and shall be tested to a hydrostatic pressure of 600 psi (4 MPa).
 - (3) Identification requirements of PG-77.1 need not be met, provided the Manufacturer certifies on the data report that materials are in conformance with Section I. Provisions shall be made by the Manufacturer enabling him to supply complete information on materials and construction of any boiler built under the above provisions (PMB-5.5).
- (d) Design rules apply to miniature boilers and parts, and shall be used in conjunction with requirements for design in Part PG of Section I.
- (e) Miniature boilers may be constructed by fusion welding in accordance with all the requirements of Part PMB, except that postweld heat treatment, radiography of the welded joint, and nondestructive examination described in PG-93.1 are not required.
- (f) Washout openings required are as follows:
- (1) Miniature boilers exceeding 12 in. (300 mm) internal diameter or having more than 10 ft.² (0.9 m²) of heating surface shall have not less than three washout plugs (brass) of 1 in. (25 mm) diameter screwed into openings in the shell near the bottom. Boilers not exceeding 12 in. (300 mm) internal diameter and having less than 10 ft.² (0.9 m²) of heating surface require not more than two 1 in. (25 mm) cleanout openings, one of which may be used for attachment of the blowoff valve.
 - (2) All threaded openings in the boiler shall be provided with welded openings as necessary to ensure at least 4 full threads therein.
 - (3) Electric boilers employing a removable top cover flange for inspection and cleanout need not be fitted with washout openings (PMB-10.2).

- (g) Feedwater supply shall be provided to miniature boilers by at least one feed pump or other feedwater device, or by connection to a water main carrying sufficient pressure to overcome internal pressure. In the event of a system operated with no extraction of steam (closed system), in lieu of a feedwater device, a connection or opening shall be provided to fill the system when cold. Such connection shall be not less than NPS 1/2 (DN 15) pipe size for ferrous pipe and NPS 1/4 (DN 8) for brass or copper pipe. The feedwater pipe shall be provided with a check valve and stop valve not less than the pipe size. Feedwater may be introduced through the blowoff opening, if desired (PMB- 11).
- (h) Each miniature boiler shall be equipped with a blowoff connection not less than NPS 1/2 (DN 15) pipe size located to drain from the lowest water space practicable. The blowoff shall be equipped with a valve or cock not less than NPS 1/2 (DN 15) size(PMB-12).
- (i) One water gage glass or water level indicator shall be provided for each miniature boiler. The lowest visible part of the water gage shall be at least 1 in. (25 mm) above the lowest permissible water level specified by the Manufacturer of the boiler (PMB-13).
- (j) All valves, pipe fittings, and appliances connected to a miniature boiler shall be at least equal to the requirements of Class 125 or Class 150 of the applicable American National Standard in PG-42 (PMB-14).
- (k) Safety valves shall be a sealed, spring-loaded type not less than NPS 1/2 (DN 15) pipe size. The maximum designed steaming capacity shall be determined by PG-70. In addition, the safety valve shall have sufficient capacity to discharge all steam that can be generated without allowing pressure to raise more than 6% above MAWP. All other provisions for safety valves shall be complied with (PMB-15).
- (l) Stop valves are fitted to each steam line from a miniature boiler as close to the boiler shell or drum as practicable, except in a closed circuit system (PMB-16).
- (m) All miniature boilers operated with gas, electricity, oil, or mechanical firing be provided with an automatic low-water fuel cutoff, except electric boilers of the electrode type provided for in PEB-16.
- (n) In addition to inspections required elsewhere in Section I, each miniature boiler shall be inspected while being tested at a hydrostatic pressure equal to three times the MAWP stamped on the nameplate (PMB-21).

7.3 Electric Boilers (Section I, Part PEB)

- (a) Electric boilers constructed under Part PEB are those receiving applied heat from electrodes or from immersion resistance elements. An electrode-type boiler is defined as one in which heat is generated by electric current using water as the conductor. An immersion resistance element-type boiler is defined as one in which heat is generated by a resistance heating element immersed in water (PEB-2).
- (b) Electric boilers shall be stamped as follows:
 - (1) with an “S” or “M” symbol stamp by the Manufacturer of the pressure vessel (PEB-2);
 - (2) with an “E” symbol stamp in addition to (a) or (c) by a boiler Assembler that affixes trim, valves, appurtenances, and threaded fittings when the Assembler does not hold “S” or “M” Code symbol stamps. Note that “E” Code symbol stamp holders are limited to assembly methods not requiring welding or brazing (PEB-2); and
 - (3) the boiler pressure vessel may be constructed to Section VIII, Division 1 rules for

unfired boilers (UW-2), subject to the following additional requirements:

- a. materials used shall be those listed in Part PEB;
 - b. inspection openings shall comply with Part PEB;
 - c. the boiler pressure vessel shall be stamped with the ASME “U” Code symbol stamp and documented on an ASME U-1 or U-1A *Manufacturer’s Data Report*; and
 - d. the *Manufacturer’s Data Report* for the completed boiler shall be the ASME P-2A form and shall carry the notation “boiler pressure vessel constructed to Section VIII, Division 1 as permitted by Part PEB.”
 - e. Stamping of electric boilers or nameplates shall conform to PG-106 of Section I.
- (c) The following design requirements should be noted:
- (1) Responsibility for design of electric boilers to be marked with the “E” Code symbol stamp shall be that of the “E” Certificate Holder (PEB-8).
 - (2) Electric boilers may be constructed by fusion welding in accordance with the requirements of PEB, except that postweld heat treatment, radiography of the welded joint, and nondestructive examinations described in PG-93.1 are not required when the following limitations are not exceeded:
 - a. 16 in. (400 mm) inside diameter of the shell;
 - b. 5 ft³ (0.14 m³) gross volume, exclusive of casing and insulation; and
 - c. 100 psig (700 kPa) maximum allowable working pressure.
 - (3) Inspection openings shall comply with PEB-10.
 - (4) Feedwater supply connections shall be NPS 1/2 (DN 15) pipe size or larger (PEB-11).
 - (5) Blowoff piping for electric boilers having a normal water content not exceeding 100 gal. (380L) requires only one valve. Minimum size of blowoff pipes and fittings shall be NPS 1 (DN 25) for boilers above 200 kW and NPS 3/4 (DN 20) for boilers of 200 kW input or less (PEB-12).
 - (6) Water level gages shall comply with requirements of PEB-13.
 - (7) Pressure gages shall meet requirements of PG-60.6 (PEB-14).
 - (8) Minimum safety valve or safety relief valve relieving capacity shall be 3 1/2 lbs/hr/kW (1.6 kg/hr/kW) input. Two or more safety or safety relief valves are required for electric boilers of more than 1,100 kW input, and one for boilers below this input (PEB-17).
- (d) Each electric boiler pressure vessel shall be hydrostatically tested at completion of fabrication in accordance with PG-21 or PMB-21, as applicable. In addition to the above, after assembly of boiler, pressure vessel, and the mechanical assembled boiler external piping and trim, the completed electric boiler shall be given a final hydrostatic test of 1 1/2 times MAWP of the pressure vessel. Miniature electric boilers that are trimmed to operate at less than the MAWP of the pressure vessel shall be given

a hydrostatic test at a pressure not less than the safety valve setting. When the electric boiler is to be marked with the "E" symbol, the symbol shall be applied after completion of the hydrostatic test of PEB-17.2.

- (e) Regarding inspection by the Inspector and/or the Manufacturer/Assembler, various alternatives as specified in PEB-18 are dependent upon the size and type of construction or assembly. These alternatives should be thoroughly understood by all parties to determine the degree of participation required by the AIA and/or the Manufacturer/Assembler.
- (f) Stamping of boiler pressure vessels and/or nameplates on completed electric boilers also offers alternatives, in addition to those set forth in 6.3(b) of this Guide (PEB-18).
- (g) Completion of required ASME *Manufacturer's Data Report* Form P-2A shall be in accordance with PEB-19.

7.4 Organic Fluid Vaporizers (Section I, Part PVG)

- (a) Materials for construction of organic fluid vaporizers do not differ from those specified for power boilers (PVG-5).
- (b) Gage glasses shall be of the flat glass type with forged steel frames. Gage test cocks shall NOT be used (PVG-10).
- (c) Drain valves of the globe or angle type may be used in lieu of the blowoff valve required by ASME B31.1.
- (d) Safety valves shall be of the totally enclosed type, so designed that vapor escaping beyond the valve seat will not discharge into an enclosed atmosphere but to an escape pipe discharging outside the building or to a suitable condenser.
- (e) Safety valves shall NOT have a lifting lever.
- (f) Safety valve body drains are not mandatory.
- (g) Safety valves shall be disconnected from the vaporizer at least annually, inspected, repaired, and if necessary, tested, and reinstalled.
- (h) A rupture disk may be installed between the safety valve and the vaporizer, provided various requirements are met as specified in PVG-12.
- (i) The vaporizer pressure vessel shall be designed per the rules of Section I for a working pressure of at least 40 psi above the operating pressure at which the vaporizer will be used.

7.5 Potable Water Heaters (Section IV, Part HLW)

- (a) Part HLW sets forth requirements unique to construction of lined water heaters supplying potable hot water for commercial purposes other than space heating. Lined vessels for storage of hot water are also included. While various types of linings are used in many of these units, fired and unfired, some materials have sufficient corrosion resistance to be utilized in construction. Therefore, while the title of this Part HLW may seem somewhat restrictive, it must be understood that UNLINED vessels are also included. A water heater is defined as a closed vessel in which water is heated and withdrawn for use external to the system, with pressure not exceeding 160 psi (1,100 kPa), and temperatures not exceeding 210°F (99°C). HLW water heaters are exempted from Section IV requirements when none of the following are exceeded:

- (1) heat input of 200,000 Btu/hr (60 kW);
 - (2) water temperature of 210°F (99°C); and
 - (3) nominal water-containing capacity of 120 gal. (450 L), except that they shall be equipped with safety devices in accordance with HLW-800.
- (b) Lining materials include glass (porcelain enamel), galvanizing (hot zinc dip), cement, copper, fluorocarbon polymer, amine, or polyamine (epoxy) (HLW-100).
 - (c) Metallic materials for shells, heads, and flues are listed in Table HLW-300 and HLW-301.1. The minimum thickness of plate materials for lined or unlined water heaters is 1/8 in. (3 mm) (HLW-301). *Material Test Reports or Certificates of Compliance* are required for all plate materials, as specified by the Material Specification, Section II of the Code (HLW-201).
 - (d) MAWP of water heaters shall be to a maximum of 160 psi (1,100 kPa) and a minimum of 100 psi (700 kPa). Temperature is limited to 210°F (99°C). Firing may be by gas, oil, or electricity. The following design requirements should also be noted and checked during any ASME Review of the Manufacturer's program.
 - (1) Where tubes are attached to tubesheets by rolling, the tubesheet shall be a minimum of 3/16 in. (5 mm) thickness. Tube holes shall have sharp edges removed on both sides by filing or another method (HLW-309).
 - (2) Where tubes are attached to the tubesheet by welding, the tubesheet hole may be beveled to a depth equal to the tubesheet wall thickness or 1/8 in. (3 mm), whichever is greater, but not more than 1/3 of the tubesheet thickness. Tubes shall not project beyond the tubesheet at a distance greater than the tube wall thickness. As an alternative, where no bevel is used, tube shall extend beyond the tubesheet not less than 1.5 times nor more than 3 times the sum of the thickness of the head, plus the thickness of the tube. See Figure HLW-413, sketch (d).
 - (e) Proof tests may be used to establish MAWP or the mathematical formulas specified may be used (HLW-501). If proof tests are used, they must be witnessed and accepted by the Inspector. Proof tests shall be recorded, certified by the Manufacturer, and maintained in the Manufacturer's records (HLW-504). Water heaters shall be subjected to a hydrostatic test, upon completion, of 1.5 times MAWP. Glass-lined, fluorocarbon polymer lined, and amine or polyamine epoxy lined water heaters shall be hydrostatically tested at a pressure equal to, but not exceeding, MAWP (HLW-505).
 - (f) Inspection, stamping, and documentation of water heaters and water storage tanks are covered by HLW-600.
 - (g) Each automatically-fired water heater, in addition to the operating controls used for normal operation, shall have separate high-temperature-actuated combustion controls that will automatically shut off the oil, gas, or electric supply to the heater. The temperature control will not allow a setting of more than 210°F (99° C) (HLW-701).
 - (h) Each water heater shall be fitted with at least one officially (ASME/NB) rated pressure relief valve or pressure temperature relief valve. These valves shall be NPS 3/4 (DN 20) or larger. The relieving capacity in Btu/hr. shall be not less than the maximum input of the burner elements. For electrically-fired water heaters, the relieving capacity shall be 3,500 Btu/hr/kW input.

7.6 Vessels Fabricated by Forging (Section VIII, Divisions 1, 2, and 3)

- (a) Forged pressure vessels fabricated without longitudinal joints are of carbon, low alloy, and high alloy steels. Except for minor non-pressure or seal welds, no welding may be performed on vessels containing carbon exceeding 0.35 percent. For minor nonpressure attachments and repairs, when the heat analysis exceeds 0.50 percent carbon, no welding of any type is permitted. A major percentage of forged vessels are high-pressure gas bottles containing welding gases such as CO₂, argon, oxygen, helium, acetylene, or high-pressure compressed air. Such bottles are fabricated by hot spin forged from heavy walled tubing or billets, usually of SA-372 Type III, IV, V, or VIII material. These bottles are liquid quenched and tempered following the forging operation. Such special requirements do not apply to austenitic steels, nor to materials not exceeding 97 ksi minimum tensile strength (UF-5).
- (b) The following items should be given close attention on an ASME Review of a Manufacturer's program:
 - (1) When SA-372 materials are quenched and tempered, as required by UF-31, a careful surface examination must be made of the material for detection of surface cracking. This examination will be by liquid penetrant or magnetic particle.
 - (2) Brinell hardness tests are required to be made and recorded per UF-31.
 - (3) Welded repairs of materials for forged vessels are restrictive in depth and by the qualified welding procedure (UF-32 and UF-37). Welders must be qualified to the welding procedure used. Radiography of repaired areas is required in many cases.
 - (4) For vessels of SA-372 Type VIII material, the completed vessel, after heat treatment, shall be subjected to ultrasonic examination of all parts. Also note that impact tests are required for this material. Certification of these tests is required (UF-5).

7.7 Vessels Fabricated by Layered Construction (Section VIII, Divisions 1, 2 and 3)

- (a) A layered vessel is defined as one having a shell and/or heads made up of two or more separate layers of material. It consists of an inner layer that forms the pressure-tight members for the shell and/or heads (shell and head layer are usually of plate materials which constitutes the overlap), building up the thickness of the shell and heads to achieve greater strength and to contain higher pressures.
- (b) Nozzle attachments to layered shells present some unique methods of attachments, as shown in Fig. ULW-18.1 of Section VIII, Division 1; under Fig. ULW-18.1, Fig. 4.13.9 of Division 2; and Articles KD-8, KD-251, KD-412, and Article KF-8 of Section VIII, Division 3. As will be noted from the foregoing, reinforcement of openings present some unique design differences in many respects from single-layer vessels. Other items differing in some marked degree from single-layer vessels are as follows:
 - (1) Welding Procedure Qualifications require some departure from the normal ones for single-layered joints. There are some variances between Section VIII, Divisions 1, 2, and 3. Various weldment configurations of Fig. UW-12 are prohibited in layered construction of Section VIII, Division 1.

- (2) Required nondestructive examinations are covered by ULW-50 through ULW-57 of Section VIII, Division 1; Table 7.4 and 7.4.11 of Section VIII, Division 2; and KF-825 of Section VIII, Division 3. These are quite extensive and require some study.
- (3) Review of a layered-vessel fabricator's Quality Management System requires a careful perusal of Part ULW of Section VIII, Division 1; 4.13, 5.9, 6.8 and 8.1.3.6 of Section VIII, Division 2; and Article KF-8 of Section VIII, Division 3.
- (4) Stamping on nameplates below the Code symbol stamp shall be "WL" to indicate welded layered construction for all divisions of Section VIII.

7.8 Low Temperature Service (Section VIII, Divisions 1 and 2)

- (a) There are mandatory requirements for vessels and vessel parts constructed of carbon and low alloy steels. For Section VIII, Division 1 construction, these requirements are based on the minimum design temperatures based on UG-20 or UCS-66. Section VIII, Division 2, contains more rigid requirements regarding impact testing of materials and dropweight tests under certain conditions. Section VIII, Divisions 1 and 2 also contain requirements for preheat of weldments and for postweld heat treatment (stress relieving of weldments). Section VIII, Division 3 requires Charpy Impact testing of all materials except for nuts and washers.
- (b) Special note should be taken on ASME Reviews involving construction for low temperature regarding the following:
 - (1) Are any of the vessels produced to be used for lethal service? If so, are provisions of Article UW-2 fully understood and followed, as well as those in (2) below?
 - (2) If not for lethal service but for low-temperature service, are provisions for impact testing in UCS-66 and UCS-67 followed? Is postweld heat treatment applied per UCS-85?
 - (3) For Section VIII, Division 2, referencing paragraphs are in 3.11 for Material Toughness Requirements.

7.9 Jacketed Vessels (Section VIII, Division 1)

- (a) References to various types of design and construction are scattered. The following are listed as ready references to the various types of jacketed pressure vessels covered by Section VIII, Division 1:
 - (1) UG-28 covers thickness of shells under external pressure. For external pressure of 15 psi (100 kPa) or less, design to Code rules for external pressure of the inner shell may not be necessary. See NOTE under UG-28.
 - (2) UW-19 covers welded stayed construction as used in staying of jacketed vessels where the jackets are of flat plate formed to the vessel contour and for pressure up to 300 psi (2 MPa).
 - (3) Appendices 9-1 through 9-10 of Section VIII, Division 1 cover full and partial jacketing of shells and heads by various jacket design. Dimpled- and embossed-types of jackets are not included in Appendix 9 of Section VIII, Division 1.

- (4) Appendix 17 of Section VIII, Division 1 covers dimpled- or embossed-type jacketing where the jackets are of two or three layers and are dimpled or embossed prior to welding, and those which are formed after welding by applying hydraulic or pneumatic pressure to the outer layer beyond the yield point of the material, thus achieving what is known as a pillow block contour.
 - (5) Welding procedures must meet unique requirements of Section VIII, Division 1. The reviewer should have a good understanding of Appendix 17-7 of Section VIII, Division 1.
 - (6) Appendix 19 of Section VIII, Division 1, covers requirements for electrically-heated or gas-fired jacketed steam kettles in which no steam or water is drawn from the jacket for use external to the vessel, and the operating pressure of the jacket is 50 psi (350 kPa) or less.
- (b) Jackets of any of the above types are integral pressure chambers attached to an inner vessel for such purposes as:
- (1) heating the inner vessel and its contents. Steam is normally used as the heating medium;
 - (2) cooling the inner vessel and its contents. Refrigerant or chilled water is normally used as the cooling medium; and
 - (3) providing a sealed insulation chamber around the inner vessel.
- (c) During review of companies fabricating the type of jacketed vessel shown in Appendix 9, attention should be directed to the following:
- (1) Do weldments conform to sketches shown in Appendix 9 as to type and size specified?
 - (2) Are inspection openings provided per UG-46, with the exception that openings need not exceed 2 in. (50 mm) size (9-4)?
 - (3) If the inner vessel is subject to lethal service, weldments of the inner vessel shall be meet UW-2. Weldments attaching the jacket to the inner vessel shall also be per requirements of UW-2, except that they need not be radiographed and fillet welds are acceptable. Postweld heat treatment shall be performed per Table UCS-56.
- (d) During review of companies fabricating dimpled or embossed jackets, an initial understanding of the method of fabrication used is necessary. The Code text should be consulted for requirements of that type of construction, and notes made for guidance during the ASME Review. This will result in an appreciable saving of time for all parties. The following shall be kept in mind as it pertains to dimpled or embossed jacket assemblies:
- (1) This type of construction shall NOT be used for containment of lethal substances.
 - (2) No direct firing or use as an unfired steam boiler is permitted.
 - (3) Unless exempted by UCS-66, carbon or low alloy steel shall not be used in the construction of dimpled or embossed jackets intended for use at temperatures below -20°F (-29°C).

- (4) For service temperatures above -20°F (29°C), metal combinations listed in Table 17-3 of Appendix 17 of Section VIII, Division 1 shall be used in the carbon steel combinations listed. Thickness limitations for metals welded by permitted processes are shown in Tables 17-4.1 and 17-4.2 of Appendix 17 of Section VIII, Division 1.
 - (5) Particular attention should be given to the method of proof tests used and to the welding procedures and resultant weldments.
- (e) During review of the companies fabricating jacketed steam kettles, as described in Appendix 19 of Section VIII, Division 1, conformance with the additional requirements listed therein is mandatory. Generally, these consist of the following:
- (1) The operating pressure of the jacket shall not exceed 50 psi (350 kPa);
 - (2) When in contact with products of combustion, stainless steel parts shall be low carbon (L) or stabilized (S) grades. Carbon steels SA-36 and SA-283 shall not be used for any pressure parts;
 - (3) Welded joints in contact with products of combustion shall be full penetration welds. Backing strips, if used, shall not be left in place;
 - (4) All jacketed steam kettles are subject to authorized inspection and shall not be stamped with a “UM” Code symbol stamp, regardless of volume;
 - (5) Capacity of safety valves in lbs/hr shall be based as a minimum upon Btu per hour input divided by 1,000, or the kilowatt rating of the electric heating element multiplied by 3.5.
 - (6) The jacket shall be fitted with the following:
 - a. a pressure gage;
 - b. a water gage glass;
 - c. provisions for adding water;
 - d. an automatic gas control valve or electric heater control actuated by pressure or temperature to maintain steam pressure below the safety valve setting;
 - e. a low-water cutoff; and
 - f. a control to cut off the gas supply in case of pilot light failure.

7.10 Pressure Vessels Marked with the Certification Mark and the “UM” Designator

- (a) Scope:
 - (1) Who is responsible to determine when a “UM” vessel will be constructed?
 - (2) Who is responsible for any straight-line interpolation for intermediate volumes and design pressures?
- (b) Quality Control Manager Responsibilities:

- (1) Who is responsible for all aspects of the “UM” vessel program?
 - (2) Who is responsible for the certification and designation of CIs?
 - (3) Are controls or procedures included in the manual for the qualification and certification of the CI?
 - (4) Is a controlled copy of the Quality System Manual provided to the CI?
- (c) Certified Individual (CI) Responsibilities:
- (1) Does the CI provide oversight as required to ensure that each use of the “UM” Designator is in accordance with the requirements of ASME Code Section VIII, Division 1?
 - (2) Does the CI verify the source of the conversion factors whenever local customary units are used?
 - (3) Does the program address that the CI shall not be directly involved in the production of items for which the CI is performing the CI duties?
 - (4) Does the program address controls for the CI’s responsibilities for carrying out all examinations and inspections as required by the Code for vessels that are to be stamped with the ASME Certification Mark with “UM” Designator?
 - (5) Does the program address that the CI is responsible for reviewing documentation for each “UM” item or lot of “UM” items to meet all applicable requirements of ASME Code Section VIII, Division 1?
 - (6) Does the program address that the CI is responsible for checking the correctness of the nameplate data and/or stamping applied to the “UM” item?
 - (7) Who is responsible for preparing the “U-3” Certificate of Compliance and submitting it to the CI for review, certification, distribution, and retention?
- (d) Records:
- (1) Are Records kept in compliance with the Record Retention Section of the Quality System Manual?
 - (2) Are Certificates of Compliance retained on file for a minimum of 5 years; or are controls in place for the Form “U-3” or “U-3A” Certificates of Compliance to be registered with the National Board, in accordance with the requirements of the manual?
 - (3) Who will maintain and keep on file current CI Certifications, along with their qualifications and training records?
 - (4) Does the Authorized Inspection Agency have the opportunity to review all practices and procedures whenever necessary to ensure that the “UM” Certificate Holder is compliant with the requirements of the Code and their Quality Management System?

7.10.1 Qualification and Designation of the Certified Individual

- (a) References:
- (1) ASME Section VIII, Division 1, UG-117(a)(1) (current Edition);

- (2) ASME QAI-1 (current Edition);
- (3) NB-383, *Rules for Certified Individuals* (current Edition).

(b) Responsibilities:

- (1) Who is responsible to control and update or revise, as necessary, CI Procedures to ensure compliance with applicable Codes, standards, and the requirements of the Quality System Manual pertaining to the qualification and designation of the CI?
- (2) Who is responsible to supervise the selection and preparation of candidates for qualification and designation as the CI?
- (3) Who shall maintain on file, in electronic and/or hard copy form, all documentation required by the procedure for CI designation?
- (4) Are qualification and designation records made available to ASME, the National Board, customers and other organizations, such as the AIA, with audit responsibilities?

(c) Qualification Requirements:

- (1) Prior to being designated as a CI, does the individual satisfy the ASME and National Board qualification requirements for:
 - a. General – The CI candidate shall have knowledge of the requirements of ASME Section VIII, Division 1, for the application of the ASME Certification Mark with the “UM” Designator.
 - b. Specific – The CI candidate shall have knowledge of the requirements of the company’s current Quality Management System.
 - c. Practical – The CI candidate shall receive documented training with the scope, complexity or special nature of the activities to which oversight is to be provided.

(d) Training Program:

- (1) Are examinations to verify an individual’s certification given to those who have satisfied the experience and physical requirements, or will those requirements be complete prior to certification?
- (2) Is the documentation showing the successful completion of the National Board online training course for CIs and the passing results of the written online examination, provided by the NB-383 process, used as evidence to fulfill these requirements?
- (3) Who is responsible to verify the results of the NB written examination of the CI prior to designation?

(e) Specific Training:

Who will provide reading and/or classroom training for the current Quality Management System, which includes the QC Manual and supporting Procedures? Who will document

this requirement, and how?

(f) Practical Training:

Do personnel being considered for certification as a CI have sufficient documented, formal on-the-job training to be thoroughly familiar with the requirements of the ASME Code sections, as they relate to the construction of pressure vessels, which are ASME marked with the “UM” Designator?

(g) Designation:

- (1) Who is responsible for performing a final evaluation and designation of the CI?
- (2) Who is responsible for verifying any prior experience or training claimed by the new employee that is necessary for certification? Is this verification documented and placed on file?
- (3) How are new employees who have documented experience equivalent to the company’s training requirements, and have passed the National Board written exam designated as a CI?
- (4) Does the new employee receive orientation on the company QC Manual?
- (5) Who is responsible for evaluating that the new employee’s performance is acceptable under work conditions, prior to any designations or documented records?
- (6) Who shall complete each designated CI?
- (7) What type of record will be used for the CI designation/certification maintained on file?

(h) Continuing Education:

- (1) Does each CI complete documented proficiency training at least once every 2 years?
- (2) Does the Quality Management System require that the appropriate National Board on-line CI training course be used to meet this certification requirement?

(i) Renewal of Qualifications:

- (1) Does the Quality Management System address renewal of qualifications for all CI’s as required by the ASME Codes?
- (2) Does the Quality Management System address how CI’s, whose employment is interrupted for any reason for more than one year, must re-establish their qualification by examination, unless documented activities associated with these responsibilities has been presented to, and accepted by, their employer?

(j) Termination:

- (1) Is the CI’s designation automatically revoked at termination?
- (2) Are controls in place for re-designation once the individual satisfies the necessary requirements?

7.11 Pressure Vessels for Human Occupancy (PVHOs)

- (a) ASME PVHO contains some unique requirements, and the Manufacturer and window fabricator performing work to this Standard must show how these requirements are satisfied within the framework of the Quality Management System. The PVHO Manufacturer and window fabricator are responsible for implementing and maintaining the quality requirements as described in ISO 9001 or ISO 13485, whichever is applicable. It is not, however, the intent of this Standard to require a PVHO Manufacturer's or window fabricator's Quality Management System to be certified in accordance with ISO 9001 or ISO 13485 requirements by a third party; and nothing in this Standard should be construed to imply such a requirement.
- (b) The design and fabrication shall be in accordance with the specified Division of Section VIII of the Code, and the following requirements common to all PVHOs, unless otherwise permitted:
 - (1) All joints of Categories A through C shall be Type No. 1 of Table UW-12 for Section VIII, Division 1 vessels, or shall be weld joint Type 1 of Table 4.2.2 and meet the requirements of paragraph 6.2.4.1 for Section VIII, Division 2 vessels.
 - a. All Type No. 1 butt welds shall be 100% radiographed in accordance with the specified Division of Section VIII of the Code.
 - b. All Type No. 7 corner welds shall be 100% ultrasonically examined.
 - (2) All joints of Category D shall be full-penetration welds extending through the entire thickness of the vessel or nozzle wall.
 - (3) The reverse side of the root pass of double welded joints shall be shown as sound by MT or PT examination.
 - (4) Intermediate heads may be designed in accordance with Fig. UW-13.1(e) for Section VIII, Division 1 vessels when the requirements of ASME PVHO-1-2016, 1-7.1(c) are met.
 - a. PVHO vessels that incorporate an intermediate head shall be inspected as follows:
 - The butt weld joint shall be 100% radiographed and 100% ultrasonic examined per the requirements of Section VIII, Division 1 or 2.
 - The butt weld, fillet weld, and/or seal weld shall be examined after hydrostatic test in accordance with the requirements for either MT examination or PT testing using the acceptance criteria applicable for the specified Division of Section VIII of the Code.
- (c) A Registered Professional Engineer, or the equivalent in other countries, shall verify that the *Manufacturer's Data Report* is compliant with the PVHO Standard and the User's Design Specification.
- (d) PVHO piping systems are subject to the same basic requirements as Section VIII, Divisions 1 and 2, as specified in this Guide, except that the details required in the User's Design Specification are identified in ASME PVHO-1-2016, 4-1.2.1.
- (e) The user, or an agent on his behalf, who intends that a piping system be designed, fabricated, tested, and certified to be compliant with Section 4 of the PVHO Standard, shall provide, or cause to be provided, a written User's Design Specification that shall set forth requirements as to the intended use and operating condition. Those requirements shall include, as a minimum, the following:
 - (1) limitations and boundaries of the piping systems;

- (2) piping system maximum operating pressures, required pressurization and depressurization rates, ventilation rates, and the condition under which those rates are to be maintainable;
 - (3) conditions affecting the requirements for, and amounts of, stored gas reserves;
 - (4) required number of breathing gas connections and their characteristics;
 - (5) data that shall be provided to the owner and the duration of retention of that data by the fabricator, if other than that required by paragraph 4-1.2.4 of Section 4 of the PVHO Standard, and the disposition of the data, should the fabricator go out of business.
- (f) In addition to the postweld heat treatment requirements in accordance with Section VIII, Parts UCS, UHA, and UHT for a Division 2 design or paragraphs 6.4 and 6.6 of the Code for a Division 2 design, spherical shells and spherical segment heads shall be PWHT regardless of thickness. The PWHT shall be done prior to the external pressure test.
- (g) The Manufacturer (PVHO) shall retain a copy of the *Manufacturer's Data Report* (PVHO-1 Form GR-1), applicable Section VIII forms and all viewport supporting documents per Section 2 of the PVHO Standard on file for at least 10 years from the date of manufacture.
- (1) In addition to the documentation, the Manufacturer (PVHO) shall furnish the following documentation to the user or his designated agent:
- a. instructions critical to the maintenance of the PVHO;
 - b. instructions critical to the operation of the PVHO and subsystems (operating procedures);
 - c. coating/painting information;
 - d. photocopy or equivalent of the PVHO data plate;
 - e. list of Standards used;
 - f. seal and gasket sizes and materials;
 - g. User's Design Specification;
 - h. evidence of successful completion of test(s) required;
 - i. system schematics (life support, hydraulics, electrical, communications, etc.);
 - j. system descriptions (life support, hydraulics, electrical, communications, etc.);
 - k. assembly drawings; and
 - l. equipment documentation (technical manuals, catalog cuts, etc.).

7.12 Heat Recovery Steam Generators (Section I, Part PHRSG)

- (a) A Heat Recovery Steam Generator (HRSG) is a boiler that has a principal source of thermal energy,

a hot gas stream having the high ramp rates, and temperatures characteristic of the exhaust of a gas turbine. It may have supplemental firing and may have one or more superheaters, reheaters, economizers, evaporators, and feedwater heaters housed in a common gas path enclosure.

- (b) For single pressure HRSGs, each superheater and reheater shall be equipped with at least one condensate detection and removal connection and piping meeting the requirements of PHRSG-3. When the HRSG is a multiple pressure steam generator, the drain and drain piping requirements of PHRSG-3 apply only to the superheater sections of the high pressure section and to each reheater. The drain requirements of PG-59.4 apply to the other superheater sections.
- (c) When de-superheater spray water is injected into superheater or reheater piping to control steam temperature, drain pots and drain piping, meeting the requirements of PHRSG-4, shall be provided.
- (d) Data reports for HRSGs shall be prepared per Part PG, but each component affected shall be identified on the *Manufacturer's Data Report* with the appropriate Part PHRSG paragraph referenced.

7.13 Locomotive Boilers (Section I, Part PL)

- (a) The rules in Part PL apply to steam locomotive boilers of all or partial riveted construction regardless of size and all locomotive boilers equal to or larger than 30 inches outside diameter on locomotives operating on track gaged 24 in. and greater with their appurtenances. Part PL shall be used in conjunction with the requirements of Part PG.
- (b) Locomotive boilers constructed without all the components in the scope of Part PL shall be hydrostatically tested by blocking or plugging the missing component openings and then stamped and documented on a PL-1 Form as a "part". Locomotive boilers constructed with all the required components shall be hydrostatically tested with all parts in place except for the pressure relief valves. A Form PL-1 shall be completed and the boiler stamped.
- (c) Materials to be used for components under stress are those found in Section II, as allowed for Section I construction, except as addressed within Parts PG, PW, PWT and PFT. Other materials allowed or specifically required for Part PL include:
 - (1) SA-675 Grades 60, 65 and 70 can be used for studs and bolts;
 - (2) SA-675 and SA-696 bar stock can be used for hollow cylindrical pressure-retaining parts (the axis of the finished part and axis of the original bar must be the same);
 - (3) threaded staybolt material shall be SA-31 Grade A or SA-675 Grade 45, 50 or 55; and
 - (4) staybolt sleeves and caps may also be SA-696 Grades B and C; SA-675 Grade 60, 65, or 70; SA-216 Grade WCA; and SA-217 Grade WC1.
- (d) Design requirements specific to locomotive boilers are found in PL-7 through PL-39.
- (e) Water gage glasses shall follow PG requirements, but for Part PL Locomotive Boilers, two are required with the lowest reading of any gage glass being at least 3 inches above the crown sheet for boilers over 36 in. inside diameter and 2 in. for boilers between 30 and 36 in. inside diameter inclusive. Water gage glass mounting, installation, and construction requirements shall be per PL-42.
- (f) Locomotive Boilers per Part PL shall be equipped with two pressure relief valves with a combined capacity sufficient to discharge all the steam supplied by the boiler without allowing the pressure to exceed 5% above the highest pressure at which any valve is set; and in no case more than 5% above the maximum allowable working pressure. At least one valve shall have a marked set pressure not to exceed the MAWP with any other valves being set above the lowest set valve with the highest

setting not to exceed 6 psi above MAWP. Specific detailed safety valve construction requirements are in PL-54.

7.14 Alternative Rules for Boiler Construction (Section I, Part PA)

- (a) The rules of this Part allow for the construction of Section I components designed and built to Section VIII, Division 2, provided all other requirements of Section I are satisfied by a Section I Certificate Holder.
- (b) The interface between the Section VIII, Division 2 component and the remainder of the Section I system shall be of welded construction.
- (c) A Certified User's Design Specification and Certified Design Report are required for the components in accordance with Section VIII, Division 2.
- (d) Layered construction is not permitted.
- (e) Components per Section VIII, Division 2, shall have all joints of Category A in accordance with Type No. 1 and all joints of Category B in accordance with Type No. 1 or No. 2.
- (f) Materials shall be limited to those permitted by both Section I and Section VIII, Division 2, and to the Division 2 design temperature limits.
- (g) The hydrostatic test required will be according to the highest pressure between the two Codes that does not exceed those stress levels prescribed by Section VIII, Division 2. The components must also be subject to the finished Section I system's hydrostatic test.
- (h) The components made to Division 2 shall be stamped with a "U2" Designator and any additional marking required by Section VIII, Division 2. It will be documented with an A-1 Data Report which shall be included in the Section I Master Data Report for the completed boiler unit and state "Component designed and constructed to Section VIII, Division 2, as permitted by Part PA".

7.15 Liquid Phase Thermal Fluid Heaters (Section I, Part PTFH)

- (a) These rules apply to closed loop liquid phase thermal fluid heaters (flooded pressure vessel) in which a heat transfer medium (thermal fluid not having a vapor pressure over 20 psia at operating temperature) is heated, but no vaporization takes place within the vessel.
- (b) External piping required consists of, as a minimum, the inlet and outlet connections for circulating the fluid, a high-point vent and low-point drain connection as applicable and one or more pressure relief valve connections. Threaded connections larger than 1 NPT and/or copper/copper alloys shall not be used. A means must be available for adding heat transfer medium under pressure.
- (c) Valves required in the inlet, outlet, drain, and vent lines are outlined in PTFH-9.3.
- (d) Liquid phase thermal fluid heaters shall have a means of expansion. A closed loop system shall have an expansion tank with a liquid level sight glass or indicator with visual or audible alarms. The tank, when closed to the atmosphere or pressurized with an inert gas, shall be manufactured to and equipped with a liquid pressure relief valve per Section I or Section VIII, Division 1.
- (e) Each heater shall be equipped with a pressure gage, temperature indicator and temperature limiting controls. It shall have a flowmeter (or differential pressure indicator) that can shut down the heat source during a no-flow condition. There shall also be a means to shut down the heat source when the expansion tank level falls below the Manufacturer's recommended level.

- (f) Each heater shall have at least one liquid service pressure relief device, with heaters over 500 ft² of liquid heating surface or 1,100 kW having at least two devices. The pressure relief device shall be selected based on the characteristics of the thermal fluid with the valve requirements as outlined in PTFH-12.
- (g) The fluid that the heater pressure vessel and pressure relief device is designed for shall be listed in the remarks section of the *Manufacturer's Data Report*.

7.16 Fiber-Reinforced Plastic Pressure Vessels (Section X)

The information contained in this section identifies specific requirements as they pertain to Section X, for fiber-reinforced plastic pressure vessels that are fabricated by bag molding, centrifugal casting, contact molding, and winding. Section X also includes high pressure metallic vessels fabricated to Section VIII, Division 3, having fiber reinforced plastic laminate wrapped around the cylindrical shell.

The scope of Section X, depending on the method of fabrication, will determine the pressure temperature limitations for the fiber-reinforced plastic pressure vessels. The scopes are as follows:

- (a) Class I Fiber-Reinforced Plastic Pressure Vessels:
 - (1) Vessels shall not exceed 150 psi (1 MPa), for vessels fabricated by bag-molding, centrifugal casting, and contact molding [RG-111(a)].
 - (2) Vessels shall not exceed the lower of 1500 psi (10 MPa) or 1/6 of the bursting pressure per RT-2, for filament-wound vessels (RG-111(a), RD-111).
 - (3) Vessels shall not exceed 3000 psi (20 MPa) or 1/5 of the bursting pressure per RT-2, for continuous filament-wound vessels with polar boss openings (RG-111(a), RD-111).
- (b) Class II Fiber-Reinforced Plastic Pressure Vessels:
 - (1) Vessels shall be limited to the product of internal pressure and inside diameter of 14,400 lb/in (2522 kPa·m), (RD-1120).
 - (2) Vessels maximum internal pressure shall not exceed 250 psi (1724 kPa), nor shall the inside diameter exceed 192 in. (4.88 m) (RD-1120).
 - (3) Vessels designed using a combination of Methods A and B shall be limited to a pressure of 100 psi (689 kPa), and a maximum inside diameter of 144 in. (3.66 m), (Figure RD-1120.1).
- (c) Class III Fiber-Reinforced Plastic Pressure Vessels:
 - (1) Vessels shall not exceed 15,000 psi (103.4 MPa) for filament wound vessels with polar boss openings.
- (d) Class I and Class II vessels shall be limited to an external pressure of 15 psi (100 kPa), with a maximum design temperature of 250°F (120°C), or 35°F (19°C) below the maximum use temperature of the resin. Class III vessels shall not exceed the lower of 185°F (85°C) or 35°F (19°C) below the maximum use temperature of the resin (RD-1120, RD-112). The minimum design temperature shall not be less than -65°F (-54°C).

7.16.1 Resin Control

- (a) Who is responsible for determining compliance with the Quality Control Tests Report for the

- resin used [RM-121, Appendix 1-110(a)]?
- (b) Who is responsible for review and approval of specifications and mixing procedures for resins [Appendix 1-110(g)(3)]?
 - (c) Are there provisions for storage, issuance, handling, and disposal of resins, catalysts and pigments [Appendix 1-110(g)(2)]?
 - (d) Are there provisions for maintaining and recording shelf lives of resins (Appendix 1-110(n), RM-121)?
 - (e) Are there provisions for maintaining identification of resins during fabrication [Appendix 1-110(e), Appendix 1-110(g)(3)]?
 - (f) Is the system used for identification and storage of resin acceptable to the Inspector (RM-121)?

APPENDIX A

National Board *Certificate of Authorization* for the “NR” Symbol Stamp

A.1 Introduction

- (a) This Appendix should be used in conjunction with the *National Board Inspection Code* ANSI/NB-23. This Section specifies the administrative requirements of the National Board necessary to obtain National Board authorization for the repair and replacement of nuclear components, items, and parts. Refer to NB-417, *Accreditation of “NR” Repair Organization* found on the National Board’s website.
- (b) This Appendix will assist the Team Leader, Members, and industry representatives in determining whether the Applicant’s system qualifies for National Board authorization. The general and administrative requirements specified in Sections 1.0, 2.1, 2.2, and 2.3 in the main text of this Guide can be used when performing surveys for issuance and renewal of the “NR” *Certificate of Authorization*.
- (c) The general format of the quality manual and implementation is indicated in the main text of this Guide and will be followed for this Appendix.

A.2 Scope

The purpose of the *National Board Inspection Code* (NBIC) is to promote public safety through a programmatic system of performing repair and replacement activities for nuclear components, items, and parts, as defined in ASME Section III, NCA-9000. This Guide, in conjunction with Part 3, 1.8.4 of the NBIC for each requested category, will ensure compliance when performing repair or replacement activities.

A.2.1 Language

An English language version of the Quality Assurance Program Manual is mandatory for use by the Survey Team, ANIS, and ANI. If the Quality Assurance Program (Quality Assurance Manual) is in a language other than English, a statement must be provided including the proviso that, in the case of conflict, the English version shall prevail.

A.3 Format for National Board “NR” *Certification of Authorization* Surveys

The Applicant must satisfactorily demonstrate by implementation the written Quality Assurance Manual. The implementation must provide sufficient evidence of the Applicant’s knowledge of design, materials, document control, procurement, control of process (welding, NDE, heat treatment, and bending and forming), nonconformances, corrective action, quality records, audits, and indoctrination and training of personnel that affect quality and other repair and replacement activities, as appropriate for the requested scope and category of work. The implementation may use current work, a mock-up, or a combination of both.

A.3.1 Survey Team Make-Up

The number of individuals who participate in the Review, as a minimum, will be four: the Team Leader, a representative of the National Board; a Team Member, a representative of the Jurisdiction; the Authorized Nuclear Inspector Supervisor (ANIS); and the Authorized Nuclear Inspector (ANI). Both the ANIS and ANI shall be representative of the accredited Authorized Inspection Agency (NB-360). When the Jurisdiction elects not to participate in the survey, a representative of the National Board will participate as a Survey Team Member. The National Board representative shall be a qualified Team Leader as specified by the National Board rules.

A.3.2 Reporting Requirements for National Board Certification

It is required that all relevant findings and corrective actions, plus applicable recommendations regarding the Applicant's survey, be reported to the National Board. The final determination for issuance of the "NR" *Certificate of Authorization* will be made by the National Board. The Team Leader shall submit the [*Qualification Review Report for Accreditation of Nuclear Repair Organizations*](#) (NB-247, latest accepted revision) identifying the scope of the Certificate; the recommended team voted action to issue, not to issue, or require agency follow-up for the "NR" *Certificate of Authorization*; and the survey checklist used for the survey of the Applicant's program.

A.3.3 Review of the Quality Assurance Program (QAP)

A.3.3.1 Title Page

Specify the name and complete physical address of the company to which the National Board "NR" *Certificate of Authorization* is to be issued. The Applicant may also include the mailing address if different from the physical location of the facility, phone number, company logo, etc.

A.3.3.2 Content Page

The Quality Assurance Program should contain a page listing the contents of the manual by subject, number (if applicable), revision level, and date of each section, as required for manual control.

A.3.3.3 Scope of the *Certificate of Authorization*

The Quality Assurance Program shall clearly indicate the scope for each category requested and type of repair and replacement activities the "NR" Certificate Holder is capable of performing and intends to carry out, and whether the activities will be conducted in the shop, at field sites, or both.

A.3.3.4 Organization

(a) *Statement of Authority and Responsibility:*

- (1) The Quality Assurance Program shall contain a *Statement of Authority and Responsibility*, signed and dated by an officer of the "NR" Certificate Holder. The *Statement of Authority* shall identify those in charge of the Quality Assurance Program (by title), and activities affecting quality shall be clearly established and documented.
- (2) The persons and organizations within the "NR" Certificate Holder's program that perform Quality Assurance functions shall have sufficient and well-defined responsibilities, authority and organizational freedom to identify quality problems, initiate action which results in solutions, verify implementation of solutions to those problems and control further processing, delivery or installation of nonconforming items, deficiencies, or unsatisfactory conditions until proper disposition has been made.

- (3) A statement that if there is a disagreement in the implementation of the Quality Assurance Program that cannot be resolved, the matter is to be referred for resolution to a higher authority within the “NR” Certificate Holder’s program that does not permit compromising the *National Board Inspection Code* (NBIC), Section III NCA-4000; NQA-1; IWA-4000 of Section XI and other standards as referenced by the quality assurance program for each category requested.

(b) Organizational Responsibility:

The “NR” Certificate Holder’s organizational responsibilities for the Quality Assurance Program, as documented in the Quality Assurance Manual shall, as a minimum, define the system used for measuring the overall effectiveness of the Quality Assurance Program and shall identify:

- (1) that persons or organizations within the program are sufficiently independent from the pressures of production;
- (2) that persons or organizations within the program shall have direct access to responsible management levels where appropriate action may be taken and to report regularly on the effectiveness of the program; and
- (3) that assurance of quality provides for individuals or groups the responsibilities of inspection, testing, checking, or otherwise verifying that an activity has been correctly performed to a specific activity or procedure.

(c) Procedures:

The Quality Assurance Program shall provide for the review, acceptance and control of written procedures that affect quality by individuals responsible within the “NR” Certificate Holder’s organization.

(d) Monitoring:

The Quality Assurance Program shall provide for monitoring of activities described in the program that affect quality and Code compliance.

A.3.3.5 Quality Assurance Program

(a) Organizational Chart:

The organizational chart shall clearly delineate the levels of responsibility, authority, and lines of communication within the “NR” Certificate Holder’s organization for the various individuals who affect quality identified in the Quality Assurance Program.

(b) Quality Assurance Manual:

- (1) The Quality Assurance Program shall be documented in detail, which shall be the major basis for the demonstration of compliance with Part 3, 1.6 of the NBIC.
- (2) The Quality Assurance Program shall be documented by written policies, procedures, and instructions and shall be based on the “NR” Certificate Holder’s requested category and scope of work to be performed.

(c) Activities Affecting Quality:

- (1) The Quality Assurance Program shall provide for the accomplishment of activities affecting quality under suitable controlled conditions. Controlled conditions include the use of appropriate equipment, suitable environmental conditions for accomplishing the activity, and assurance that prerequisites for the activity have been satisfied.
- (2) The Quality Assurance Program shall consider the need for special controls, processes, test equipment, tools, and skills to attain the need for verification of quality by inspection and testing.
- (3) The Quality Assurance Program shall provide for the ready detection of nonconforming material and items, and for the timely and positive corrective actions.

(d) Indoctrination and Training:

- (1) The Quality Assurance Program shall establish criteria for indoctrination and training of all personnel that affect quality. The program shall also ensure that suitable proficiency is achieved and maintained for all individuals that affect quality.
- (2) The indoctrination and training program shall include those individuals performing quality functions within the scope of the rules of the NBIC, Section III, NCA-4000; NQA-1; IWA-4000 of Section XI, and other standards referenced within the Quality Assurance Program. This responsibility is extended to subcontractor's personnel to ensure that their appropriate qualifications are achieved and maintained when providing service.

(e) Quality Assurance Program Revisions:

- (1) When revisions are required to the Quality Assurance Program, the "NR" Certificate Holder shall submit all proposed revisions to the ANIS for acceptance prior to implementation.
- (2) The "NR" Certificate Holder shall submit objective evidence to the ANI that all revisions have been accepted by the ANIS.

(f) Quality Assurance Manual:

The "NR" Certificate Holder shall make available a current copy of the Quality Assurance Program (manual) to the ANI where the work is being performed.

(g) Repair/Replacement Activities:

All repair or replacement activities shall be controlled at all points necessary to ensure conformance to the rules of the NBIC, ASME, and other standards referenced within the Quality Assurance Program.

(h) Drawings, Process Sheets, and Documentation:

The "NR" Certificate Holder shall make available to the ANI all drawings, process sheets, and documentation necessary to ensure that the program is compliant with all applicable Code requirements.

A.3.3.6 Design Control

- (a) When performing repair/replacement activities, the “NR” Certificate Holder shall ensure that all applicable information, i.e., drawings, specifications, or instructions furnished by the owner satisfies the applicable Code, Edition, and addenda, as specified in the User’s Design Specification.
- (b) The repair/replacement program of the “NR” Certificate Holder shall establish controls to correctly incorporate the requirements of the Owner’s or User’s Design Specification into their program. The “NR” Certificate Holder shall implement a program which provides for compliance to the Owner’s or User’s Design Specification by establishing requirements for:
 - (1) calculations, drawings, specifications, and other instructions;
 - (2) Code Edition and addenda, as required by the User’s Design Specification;
 - (3) appropriate quality standards are specified and included in all quality records; and
 - (4) applicable documentation submitted by the owner as pertaining to the applicable requirements of the User’s Design Specification is reviewed for compliance in accordance with ASME Section XI.
- (c) The repair/replacement activities shall ensure that specifications, drawings, calculations, and instructions are not in conflict with the Owner’s or User’s Design Specification. To accomplish this requirement, the program shall provide for a system that will resolve or eliminate the conflict. This system shall establish the appropriate criteria to satisfy Code requirements by reconciling any conflicts between the owner or user and the repair/replacement organization.

A.3.3.7 Procurement Document Control

- (a) The Quality Assurance Program shall identify requirements for procurement document control that will identify the specific requirements for the procurement of materials, items, and subcontracted services. The system shall also include requirements to the extent necessary to ensure compliance with the Design Specification and Code requirements.
- (b) As a minimum, the procurement document control system shall require how suppliers of materials and services qualify to be able to participate in the organization’s Quality Assurance Program. Measures shall be established to ensure that all purchased items and services conform to these requirements. To qualify suppliers, material must be compliant with the following:
 - (1) If the supplier of material is a material organization that possesses an ASME QSC *Certificate of Accreditation* or an “N”-Type Certificate Holder that is authorized in the scope of their *Certificate of Authorization* to perform material organization functions, the “NR” organization shall have a copy of the appropriate Certificate from the society that identifies the scope of activities permitted, the Certificate number, and expiration date.

- (2) If the supplier of material is not an ASME QSC Certificate Holder, the supplier shall have a Quality Assurance Program consistent with the applicable requirements of the Edition and addenda of Section III, NCA 3800.
- (3) If the supplier is supplying services, i.e., nondestructive examination, heat treatment, calibration, or auditing, the supplier must satisfy the requirements of Section III, NCA-4000; Section XI, IWA-4000; or other standards specified in the NBIC, Part 3, for each applicable category.

A.3.3.8 Instructions, Procedures, and Drawings

- (a) The Quality Assurance Program shall establish controls for all activities that affect quality during the repair/replacement process. These activities shall include drawings, instructions, and procedures used to ensure Code compliance. Also, controls must be established to ensure that the Design Specification requirements are identified within these documents and are compliant with the Code Edition and addenda, as specified.
- (b) The controls for instructions, procedures, and drawings shall include the appropriate quantitative and qualitative criteria for determining that the activities affecting quality have been satisfactorily accomplished.
- (c) The “NR” Certificate Holder shall maintain a written description of instructions, procedures, or drawings used by the organization for control of quality and examination requirements that are detailed in the Quality Assurance Program. In all cases, these instructions, procedures, and drawings shall be readily available to the Authorized Nuclear Inspector (ANI).

A.3.3.9 Document Control

- (a) The Quality Assurance Program shall establish a system of controls for the issuance, use, and distribution of documents, including revisions that affect quality. Some of the documents under this system include specifications, instructions, process sheets, purchase orders, approved vendors listing, drawings, etc.
- (b) The system shall ensure that the latest applicable documents, including revisions, are reviewed for adequacy and approved for release by authorized personnel and distributed for use as prescribed in the Quality System Manual.

A.3.3.10 Control of Purchased Material, Items, and Services

- (a) The Quality Assurance Program shall identify controls for the receipt of all purchased material, items, and services. This system shall be used to ensure that all purchased material, items, and services comply with the applicable requirements of the Design Specification, applicable Code of Construction Edition and addenda, and owner’s quality program, if applicable.
- (b) The Quality Assurance Program for this system shall include provisions that all purchased materials, items, or records are identified to ensure traceability during the repair/replacement activities.

- (c) This system shall also provide controls for the identification of material, items, or records used for source evaluation of suppliers. These controls ensure objective evidence is provided to verify quality standards for material examination upon receipt at the repair/replacement organization.

A.3.3.11 Identification and Control of Material and Items

- (a) The Quality Assurance Program shall establish controls for the identification of material and items, including partially fabricated assemblies. The control requirements shall include measures that the identification and traceability is maintained. This system shall provide measures to ensure that incorrect or defective items are not integrated into the Quality Assurance Program.
- (b) The controls shall establish methods to be used for permanent or temporary identification. Markings shall be legible and not detrimental to the component or system involved. The marking system used shall be located in areas that will not interfere with the function or the quality aspects of the item.
- (c) Included in this system shall be provisions that all certified *Material Test Reports* and/or *Certificate of Compliance* are traceable to the material or item used in the repair/replacement activity. The system shall also provide that the certified *Material Test Report* is verified against the applicable material specification requirements of Section II, and the additional requirements of Sections III; XI Code Edition and addenda, or other standards as applicable for the category of work.

A.3.3.12 Control of Processes

- (a) The Quality Assurance Program shall provide for control of processes used during the repair/replacement program. Provisions shall be made for the control of welding, NDE, heat treatment, and bending and forming processes.
 - (1) Welding activities shall provide for qualification and maintenance of welding procedures and welders in accordance with the requirements of the Edition and addenda of the Code of Construction.
 - (2) NDE activities shall provide for qualification of NDE procedures and NDE examiners. This shall include provisions for subcontracted services.
 - (3) Heat treatment activities shall provide for qualification of heat treatment procedures and personnel. This shall include provisions for subcontracted services.
 - (4) Bending and forming activities shall provide for design and process used to control the activity. This shall include provisions for subcontracted services.
- (b) To implement this program, the repair/replacement organization shall provide that travelers, checklists, process sheets, or equivalent documentation is used to identify the applicable procedures used for welding, NDE, heat treatment, and bending and forming process. Documents shall identify which procedures, document numbers, and revision levels were used for the work.

A.3.3.13 Examinations, Tests, and Inspections

- (a) The Quality Assurance Program shall provide travelers, process sheets, or checklists prepared by the "NR" Certificate Holder that provides for in-process and final inspections as required to meet the Code of Construction Edition and addenda. The traveler, process sheet, or checklist shall identify procedures to be used and provide for documenting inspections by the "NR" Certificate Holder's personnel and any ANI hold points that may have been established. All verification of examination and ANI hold points shall be signified by written signature/initial and date, or as specified in the quality program.
- (b) All examination activities shall be performed by individuals who do not directly report to the immediate supervisor responsible for the work being performed. The traveler, process sheet, or checklist shall provide for space to document procedures used and the results of examinations and tests.

A.3.3.14 Test Control

- (a) The Quality Assurance Program shall provide for test control. Controls shall specify that tests be performed in accordance with written test procedures which incorporates or references the requirements and acceptance limits contained in the applicable design documents and Code of Construction.
- (b) The Quality Assurance Program shall identify provisions for assuring all test requirements have been complied with and that adequate instrumentation is provided and used. Adequate monitoring should be provided during the applicable test or tests and provisions made for:
 - (1) calibrated instrumentation;
 - (2) use of only trained and qualified personnel;
 - (3) condition of the test and the item to be tested;
 - (4) suitable environmental conditions; and
 - (5) data acquisition.

A.3.3.15 Control of Measurement and Test Equipment

- (a) The Quality Assurance Program shall provide for the control of measurement and test equipment. The system described shall provide for using calibrated tools, gages, instruments, other measuring and test equipment, and other devices used to verify conformance to procedures or other applicable requirements. Measurement and test equipment used shall be within the proper range, type, and accuracy, as required.
- (b) Calibration of measurement and test equipment shall be performed in accordance with written procedures to include the following:
 - (1) identification of the test equipment;
 - (2) adjustments or calibration frequencies to maintain accuracy;

- (3) calibration requirements shall be traceable to known standards or the device Manufacturer; and
- (4) calibration records to be used and maintained.

A.3.3.16 Quality Records

- (a) The Quality Assurance Program shall provide for the owner/user designating what records are to be maintained at a location mutually agreed upon by the owner and the “NR” Certificate Holder. These records shall be maintained for a period of five years after completion of the repair/replacement activity.
- (b) As a minimum, quality records to be maintained are material, certifications, fabrication activities, examinations, and tests performed before and during the repair/replacement activity. Other records, such as procedures, e.g., welding, NDE, heat treatment, specifications, etc., shall be maintained. Drawings used shall be fully identified by pertinent material or item identification numbers, revision numbers, and issue dates. In addition to the above, the “NR” Certificate Holder shall maintain records for qualifications of personnel, procedures, equipment, and related repairs. All records shall be protected against deterioration and damage while under the “NR” Certificate Holder's care.
- (c) The “NR” Certificate Holder can use any system as he/she deems appropriate to maintain quality records. The system used shall provide for access and availability of all required quality records by authorized personnel, which includes the owner/user and the ANI. This can be accomplished by the application of a record index system that identifies where the records are and who has access to these records. Quality records are the basis to verify compliance with the applicable engineering documents and the “NR” Certificate Holder’s Quality Assurance Program.

A.3.3.17 Examination or Test Status

- (a) The Quality Assurance Program shall provide for identification of examinations performed and test status of parts, items, or components during the repair/replacement activity.
- (b) The system used to provide positive identification of parts, items, and components could range from stamps, labels, routing cards, or other acceptable methods identified in the “NR” Certificate Holder's program, if it satisfies the applicable requirements of the owner/user and shall provide for any procedures or instructions to achieve compliance. Also, the system shall provide for identification of acceptable and nonacceptable items and procedures for the control of status indicators, including the authority for application and removal of those indicators.

A.3.3.18 Nonconforming Materials or Items

- (a) The Quality Assurance Program shall provide for the control of nonconforming materials and items that do not conform to the specific requirements outlined in the accepted quality program. The system shall provide for identification of nonconforming material and items from inadvertently being used until a decision on the disposition of the nonconformity is resolved by the “NR” Certificate Holder and if required, the owner/user.
- (b) The Quality Assurance Program shall include procedures for identification, documentation, segregation, and disposition of nonconformances. The nonconforming items shall be reviewed for acceptance, rejection, or repair in accordance with the applicable Code and owner’s/user’s requirements.

- (c) The Quality Assurance Program shall include provisions for the responsibility and authority in the “NR” Certificate Holder's program for the disposition of conformities and the acceptance of the ANI; and shall provide for material or items to be re-examined in accordance with the applicable procedures that will ensure compliance.
- (d) The Quality Assurance Program shall provide for responsibility of closure and final review of the ANI Nonconformance records which shall be maintained as required by A.3.3.16 above.

A.3.3.19 Corrective Action

- (a) The Quality Assurance Program shall establish requirements for corrective actions for conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material, and equipment.
- (b) The corrective action program shall identify significant conditions adverse to quality and provide actions to eliminate, if possible, such conditions so they do not reoccur. The significant conditions adverse to quality shall be evaluated to establish the cause and condition that caused the nonconformity and shall provide for the appropriate corrective action taken. This corrective action shall be documented and records maintained by the “NR” Certificate Holder.

A.3.3.20 Audits

- (a) The Quality Assurance Program shall provide for planned annual comprehensive audits to ensure that the “NR” Certificate Holder’s entire program is compliant with the Quality Assurance Program, as provided in the NBIC. Responsibilities for scheduling, assigning, documenting and reporting results to management shall be clearly defined.
- (b) Audits shall be performed in accordance with written procedures or checklists by auditors not having direct responsibility in the area or areas being audited. Auditors and lead auditors shall be qualified by the “NR” Certificate Holder in accordance with the applicable requirements of NQA-1, or ANSI 45.2, as applicable.
- (c) All audit results shall be documented by the auditing personnel for review by management having responsibility in the area being audited.
- (d) Deficiencies discovered due to an audit may require follow-up action, including a re-audit of deficient areas.
- (e) Audit results/reports shall be made available to the ANI.

A.3.3.21 Authorized Nuclear Inspector

- (a) The Quality Assurance Program shall provide for the ANI to have available all latest documents, including the Quality Assurance Program, for review and acceptance as required.
- (b) Provision shall be made to ensure that the ANI is consulted prior to the issuance of repair/replacement activities for the Inspector to review and accept the proposed repair or replacement methods and select any inspection points that may be necessary to verify compliance.
- (c) The ANI shall not sign Form NR-1 or NVR-1, as applicable, unless satisfied that all work

performed is in accordance with the NBIC and other Codes used for the work performed.

A.3.3.22 Interface with the Owner's Repair/Replacement Program

- (a) For Category 2 or 3 when applicable, the Quality Assurance Program shall provide for interface with the owner's repair/replacement program. The owner's ANI must accept the "NR" Certificate Holder's repair/replacement plan prior to implementation.
- (b) The "NR" Certificate Holder's repair/replacement activities for components shall meet Section XI requirements or other standards for Category 3 and the requirements of the Jurisdiction where the nuclear power plant is located.
- (c) The Quality Assurance Program shall provide that repair/replacement activities of nuclear components be recorded on the National Board Report Form NR-1 or Form NVR-1, as applicable and stamping when required.

A.3.3.23 Code Books

- (a) The Applicant shall have a current Edition and addenda of the *National Board Inspection Code* and have available a copy of Section III or Section XI proposed Edition/addenda used to meet requirements of Category 1 or 2, and for Category 3, the appropriate standards specified for the work.
- (b) The scope of the Applicant's Quality Assurance Program will determine what additional ASME Code books are required. For example, if the Applicant's scope is for repair/replacement of Section III, Class 1, 2, and 3 components, then all Code books identified in Section 5.0 shall be available when required to perform the work.
- (c) All applicable Codes shall be available during the survey of the Applicant's Quality Assurance Program.

A.4 NBIC References for National Board "NR" Certificate of Authorization – Surveys for Nuclear Repair/Replacement Activities

The following compilations of the NBIC follow the general format of A.3 of this Appendix, but differ in the numbering of paragraphs and, in some cases, subject matter. This list of references may not be all-inclusive. Refer to the current Edition of Part 3, 1.6.6 for Category 1; 1.6.7 for Category 2; and 1.6.8 for Category 3.

A.4.1 Quality Assurance Program

- (a) Review - NBIC – Part 3, 1.6.4 and 1.6.5.
- (b) Quality Assurance Program rules are identified in NBIC Part 3, subsections 1.6.6, 1.6.7, and 1.6.8 for each category of activity and shall follow the requirements specified in Table 1.6.2 of the NBIC.
- (c) Scope – see 1.6.6.1 for Category 1; 1.6.7.1 for Category 2; and 1.6.8.1 for Category 3. The Applicant shall address all requirements in their written Quality Assurance Program based on the category and scope of work to be performed to which certification is requested. Extent of scope (capability) shall be clearly defined within the quality manual.

A.4.2 Title Page

- (a) Are there provisions for a Title Page?
- (b) Does the Title Page identify the Applicant's name and complete physical address?

- (c) Is the Title Page part of the revision control system of the Quality Assurance Program?
- (d) If required by the Quality Assurance Program, does the Title Page provide for approval by the Applicant and acceptance of the ANIS?

A.4.3 Content Page

- (a) Are there provisions for a Content Page?
- (b) Does the Content Page indicate sections by identification and section number?
- (c) Is the Content Page part of the revision control system of the Quality Assurance Program?
- (d) If required by the Quality Assurance Program, does the Content Page provide for approval by the Applicant, and acceptance by the ANIS?

A.4.4 Organization

	Part 3, 1.6
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A.4.4.1 *Statement of Authority and Responsibility*

	Part 3, 1.6; ASME NQA-1
(a) Does the <i>Policy and Responsibility Statement</i> clearly establish responsible individuals for activities affecting quality?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)
(b) Does the <i>Policy and Responsibility Statement</i> identify persons or organizations performing Quality Assurance Program functions to have sufficient and well-defined duties, responsibility, authority, and organizational freedom to identify quality problems, initiate action which results in solutions, verify implementation of solutions, and control further processing and delivery or installation of nonconforming items?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)
(c) Is there a statement in the <i>Policy and Responsibility Statement</i> that in case of conflicts, final disposition shall be made by an officer of the organization?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)
(d) Is the <i>Policy and Responsibility Statement</i> signed by management that is responsible for the “NR” program?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)

A.4.4.2 Organizational Responsibilities

	Part 3, 1.6; ASME NQA-1
(a) Are personnel (QA & QC) responsible for defining and measuring quality program effectiveness sufficiently independent from the pressures of production?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a) Organizational Chart/Text
(b) Do personnel (QA & QC) responsible for defining and measuring quality have direct access to the responsible management pertaining to quality matters?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a) Organizational Chart/Text
(c) Are measures established that individuals (QA & QC) assigned the responsibility for inspections, testing, checking, or otherwise verifying that an activity which affects quality has been correctly performed, and are those individuals independent from the group or groups (production) directly responsible for performing the activity?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a) Organizational Chart/Text
(d) Does the Applicant's Quality Assurance Program provide for an organizational chart that defines the organizational structure of the organization and clearly identifies the responsibilities, levels of authority, and lines of communication for various individual titles involved in the Quality Assurance Program?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)
(e) Is the organizational chart consistent with the requirements in the text of the Quality Assurance Manual?	Part 3 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)

A.4.4.3 Quality Assurance Program

	Part 3, 1.6.5; ASME NQA-1
(a) Are there provisions for reviewing approved written procedures by QA or QC personnel and monitoring all activities related to the Quality System Program?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(b) Is the organizational chart consistent with the requirements in the text of the Quality Assurance Manual?	Part 3, 1.6.6.2 a); 1.6.7.2 a); 1.6.8.2 a)
(c) Is the Applicant's Quality System Program documented in sufficient detail? If not, are there supporting procedures or instructions for the implementation of the program?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(d) Is the Applicant's program, as documented in the Quality System Program (QA Manual), or supporting procedures and instructions applicable for the scope of repair/replacement activities the Applicant intends to perform?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(e) Does the Applicant's Quality System Program provide for the accomplishment of activities affecting quality under controlled conditions, which includes the use of appropriate equipment and suitable environmental conditions?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(f) Are there provisions for special controls, processes, test equipment, tools, and skills to attain the required quality?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(g) Are there provisions for verification of quality by inspections and tests?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(h) Are there provisions for detection of nonconforming materials and items, and for corrective action in a timely manner?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)

A.4.4.4 Indoctrination and Training

	Part 3, 1.6; ASME NQA-1
(a) Does the Applicant's Quality System Program provide for indoctrination and training of all personnel that affect quality as necessary to ensure that suitable proficiency is achieved and maintained?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(b) Does the indoctrination and training program satisfy NQA-1 or ANSI 45.2?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(c) Does the Applicant's Quality System Program criteria provide for the applicable manager or department heads to be responsible for indoctrination and training in their area, i.e., QA, inspection and test personnel, welders, NDE examiners, and heat treatment operators?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(d) Are there provisions for annual scheduling of training for personnel that affect quality?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(e) Are there provisions for documenting training, i.e., subject matter, length of training, instructor, and attendance sheet?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(f) Are there provisions that subcontracted service personnel have indoctrination and training commensurate with activities affecting quality?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)

A.4.4.5 Quality Assurance Program Revisions

	Part 3, 1.6; ASME NQA-1
(a) Are there provisions in the Applicant's Quality Assurance Program that proposed revisions to the Quality Assurance Program shall receive prior concurrence of the Authorized Inspection Agency (Authorized Nuclear Inspector Supervisor, ANIS) before the revisions are implemented?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
(b) Are there provisions for revisions accepted by the Authorized Inspection Agency that objective evidence of this acceptance shall be promptly presented to the ANI?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)

(c) Are there provisions that the ANI is provided with a current controlled copy of the Applicant's written Quality Assurance Program (QA	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
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A.4.4.6 Quality Assurance Manual

	Part 3, 1.6; ASME NQA-1
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(a) Are there provisions in the Quality Assurance Manual (Quality Assurance Program) that all activities that affect quality are controlled at all points necessary to ensure compliance with the Quality Assurance Program?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
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(b) Are there provisions that responsible personnel that affect quality have a controlled copy of the Applicant's written Quality Assurance Program (QA Manual)?	Part 3, 1.6.6.2 b); 1.6.7.2 b); 1.6.8.2 b)
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(c) Are there provisions in the Applicant's Quality Assurance Program for all drawings, process sheets, and other documentation necessary to make the Quality Assurance Program intelligible be made available to the ANI?	Part 3, 1.6.6.2 s); 1.6.7.2 s); 1.6.8.2 s)
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A.4.5 Design Control

	Part 3, 1.6; ASME NQA-1
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(a) Have provisions been established that ensures all repair/replacement activities are in accordance with the Owner's Design Specification?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
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(b) Has the Applicant established a system that all design drawings, or other specifications or instructions furnished by the owner, will ensure the Code Edition and addenda of the Owner's Design Specification will be compliant?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
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(c) Is there a system in place for the review and acceptance of design drawings or other specifications submitted by the owner to ensure the Applicant is capable of performing the required work in accordance with the applicable sections of the Code Edition and addenda of ASME Section XI and the NBIC?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
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(d) Is there a system in place that ensures the Applicant's program will correctly incorporate the Owner's Design Specification requirements into their specifications, drawings, procedures, and instructions which may be necessary to carry out the work?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
(e) Are there provisions to ensure that the appropriate quality standards are specified and included in the quality records?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
(f) Are there provisions that the quality records established by the Applicant's Quality Assurance Program satisfy Section XI and the NBIC?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
(g) Are there provisions to ensure any conflicts with the Owner's Design Specification are resolved or eliminated?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)
(h) If there are conflicts with the Owner's Design Specification, are there provisions to reconcile the system implemented to resolve or eliminate the conflicts with the owner and "NR" Certificate Holder in accordance with IWA-4000 of Section XI of the ASME Code?	Part 3, 1.6.6.2 c); 1.6.7.2 c); 1.6.8.2 c)

A.4.6 Procurement Document Control

	Part 3, 1.6; ASME NQA-1
(a) Has the Applicant's Quality Assurance Program provided to the extent necessary for the control for procurement of material, items, and subcontracted services?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(b) Does the control of procurement documents employed by the Applicant's Quality Assurance Program provide that material, items, and subcontracted services comply with the Owner's Design Specification and the NBIC?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(c) Does the Applicant's Quality Assurance Program provide for evaluation (surveys and audits) for material, items, and subcontracted services, to the extent permitted by the NBIC and the applicable requirements of the Code of Construction?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(d) Does the Applicant require that surveys and audits can only be performed by qualified personnel (lead auditors and auditors)?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)

(e) Does the Applicant's Quality Assurance Program establish requirements that approval of material, items, and subcontractor services are documented, e.g., an approved supplier's list, approved vendor's list, similar documentation, etc.?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(f) Does the documentation pertaining to material suppliers identify the name, location, limitations, or the revision level and date of the subcontractor's Quality Assurance Program and when the subcontractor's certificate expires?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(g) Does the Applicant's Quality Assurance Program provide for continued audits and source evaluations to ensure that material, items, and subcontracted services are maintaining their proficiency?	Part 3, 1.6.6.2 d); 1.6.7.2 d); 1.6.8.2 d)
(h) Are there provisions in the Applicant's Quality Assurance Program that copies of procedures, used for material, items, and subcontracted services, shall be made available to the	Part 3, 1.6.6.2d); 1.6.7.2 d); 1.6.8.2 d); also see 1.6.6.2 s); 1.6.7.2 s); 1.6.8.2 s)

A.4.7 Instructions, Procedures, and Drawings

	Part 3, 1.6; ASME NQA-1
(a) Does the Applicant generate and approve procedures and are these procedures, instructions, and drawings appropriate to the circumstances for the repair/replacement activity?	Part 3, 1.6.6.2 e); 1.6.7.2 e); 1.6.8.2 e)
(b) Do the instructions, procedures, and drawings identify the appropriate quantitative and qualitative criteria for determining that the repair/replacement activities affecting quality have been satisfactorily accomplished?	Part 3, 1.6.6.2 e); 1.6.7.2 e); 1.6.8.2 e)
(c) Does the Applicant maintain written procedures, i.e., NDE, welding, heat treatment, bending and forming, to be used for the control of quality and examination requirements?	Part 3, 1.6.6.2 e); 1.6.7.2 e); 1.6.8.2 e)
(d) Are instructions, procedures, and drawings to the correct revision, and have the documents, including revisions, been approved as required by Applicant's Quality Assurance Program, Owner's Design Specification, Code of Construction, Section XI, and NBIC requirements?	Part 3, 1.6.6.2 e); 1.6.7.2 e); 1.6.8.2 e)

(e) Are provisions in the Applicant's Quality Assurance Program that all instructions, procedures, and drawings are to be made available to the ANI?	Part 3, 1.6.6.2 e); 1.6.7.2 e); 1.6.8.2 e); also see 1.6.6.2 s); 1.6.7.2 s); 1.6.8.2 s)
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A.4.8 Document Control

	Part 3, 1.6; ASME NQA-1
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(a) Are there provisions in the Applicant's Quality Assurance Program for the control, issuance, use, and disposition of specifications, instructions, procedures, and drawings, including revisions, to these documents?	Part 3, 1.6.6.2 f); 1.6.7.2 f); 1.6.8.2 f)
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(b) Are there provisions for the levels of responsibility within the Applicant's Quality Assurance Program for the control of documents?	Part 3, 1.6.6.2 f); 1.6.7.2 f); 1.6.8.2 f)
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(c) Are there provisions for the approval, issuance, distribution, and retrieval of documents, i.e., specifications, instructions, procedures, and drawings?	Part 3, 1.6.6.2 f); 1.6.7.2 f); 1.6.8.2 f)
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(d) Has the Applicant defined the documents, i.e., specifications, instructions, procedures, and drawings, that are considered applicable to be included in the document control system?	Part 3, 1.6.6.2 f); 1.6.7.2 f); 1.6.8.2 f)
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(e) Are there controls that the latest revisions of specifications, instructions, procedures, and drawings are to be used and issued to the appropriate group or organization responsible for compliance?	Part 3, 1.6.6.2 f); 1.6.7.2 f); 1.6.8.2 f)
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A.4.9 Control of Purchased Material, Items, and Services

	Part 3, 1.6; ASME NQA-1
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(a) Does the Applicant's Quality Assurance Program establish measures to ensure that all purchased material, items, and services conform to the requirements of the Owner's Design Specification?	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)
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(b) Does the Applicant's Quality Assurance Program provide that all material, items, and services comply to Section XI?	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)
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(c) Has the Applicant's Quality Assurance Program provided for the identification and traceability of material, items,	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)
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(d) Are provisions established in the Applicant's Quality Assurance Program that the method of identification, i.e., low-stress die-stamping and markings, is not detrimental to the integrity of the pressure-retaining capabilities of the material or items?	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)
(e) Does the Applicant's Quality Assurance Program provide for source evaluation and objective evidence that the quality standards for material examination have been met upon receipt?	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)
(f) Does the Applicant's Quality Assurance Program provide for handling, storing, and issuing of material and items for the repair/replacement activities?	Part 3, 1.6.6.2 g); 1.6.7.2 g); 1.6.8.2 g)

A.4.10 Identification and Control of Material and Items

	Part 3, 1.6; ASME NQA-1
(a) Has the Applicant provided for the identification and control of material, including partially fabricated assemblies, in the Quality Assurance Program?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(b) Does the Applicant ensure that identification of material and items is maintained and traceable on the component or on a record during the repair/replacement activity?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(c) Is the system used for identification and control of material designed to prevent the use of incorrect or defective items and those items which have not received the required examinations, tests, or inspections?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)

A.4.10.1 Identification Markings

(a) Does the Applicant's Quality Assurance Program provide for permanent or temporary identification markings, and is the method used legible and not detrimental to the component or system?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(b) Have provisions been made to ensure that the markings are located on areas of the component, part, or item that will not interfere with the function or quality aspect of the item?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)

A.4.10.2 Certified Material Test Reports and Certificate of Compliance

(a) Does the Applicant's Quality Assurance Program require that all material used in repair/replacement activities be compliant with the Material Specification identified in Section II, and any additional requirements as specified in the original Code of Construction Edition and addenda for the component, item, or part?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(b) Does the Applicant's Quality Assurance Program provide for the use of checklists, providing record that the certified <i>Material Test Report</i> and <i>Certificate of Compliance</i> have been received, reviewed, and found acceptable to quality requirements for the repair/replacement activity?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(c) Depending on the scope of the Applicant's Quality Assurance Program, is the Applicant authorized to perform examinations and tests in accordance with the original Code of Construction Edition and addenda?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)
(d) Has the Applicant provided for certification of certified <i>Material Test Reports</i> and <i>Certificates of Compliance</i> that the material used satisfies the original Code of Construction Edition and addenda requirements?	Part 3, 1.6.6.2 h); 1.6.7.2 h); 1.6.8.2 h)

A.4.11 Control of Processes

	Part 3, 1.6; ASME NQA-1
(a) Does the Certificate Holder's Quality Assurance Program operate under a controlled system using process sheets, checklists, travelers, or equivalent procedures?	Part 3, 1.6.6.2 i); 1.6.7.2 i); 1.6.8.2 i)
(b) Are measures established to ensure that processes such as welding, nondestructive examination and heat treating are controlled in accordance with the rules of the applicable section of the NBIC? Are these processes accomplished by qualified personnel using qualified procedures?	Part 3, 1.6.6.2 i); 1.6.7.2 i); 1.6.8.2 i)
(c) Are there provisions in the Applicant's Quality Assurance Program that specifies travelers, checklists, process sheets, etc., shall identify procedures, including document number and revision level for each process, i.e., welding, NDE, heat treatment, and bending and forming, to be used?	Part 3, 1.6.6.2 i); 1.6.7.2 i); 1.6.8.2 i)

(d) Does this document provide space for reporting completion results of specific operations of the repair/replacement activity?	Part 3, 1.6.6.2 i); 1.6.7.2 i); 1.6.8.2 i)
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A.4.12 Examination, Test, and Inspection

	Part 3, 1.6; ASME NQA-1
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(a) Are in-process and final examinations and tests established to ensure conformance with specifications, drawings, instructions, and procedures, which incorporate or reference the requirements and acceptance limits contained in the applicable design documents?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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(b) Are examination activities to verify the quality of work performed by persons, other than those who performed the activity, being examined?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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(c) Are provisions made to ensure those persons performing examination activities do not report directly to the immediate supervisors responsible for the work being examined?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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(d) Do the process sheets, travelers, or checklists include the document numbers and revisions, to which the examination or test is to be performed, have adequate space provided for recording results?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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(e) Does the Applicant's Quality Assurance Program provide space on the travelers, process sheets, or checklists for establishing that hold points by the ANI were performed?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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(f) Are provisions provided that state a hold point cannot be bypassed without the consent of the inspection and test personnel or the ANI, as appropriate?	Part 3, 1.6.6.2 j); 1.6.7.2 j); 1.6.8.2 j)
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A.4.13 Test Control

	Part 3, 1.6; ASME NQA-1
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(a) Are there provisions in the Applicant's Quality Assurance Program that all testing shall be performed in accordance with the owner's written test procedures?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)
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(b) Are there provisions in the test procedures that the acceptance criteria and applicable limits are provided in accordance with the applicable design documents?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)
(c) Are there provisions in the test procedures that the requirements established shall be complied with?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)
(d) Are there provisions in the test procedures that specifies instrumentation to be used and provides for monitoring activities during the test?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)
(e) Are there provisions in the test procedures for calibration of instrumentation, use of the proper equipment, trained and qualified personnel, condition of the test equipment, suitable environmental conditions, and data acquisition?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)
(f) Are there provisions in the Applicant's Quality Assurance Program for documenting and evaluating the test results to ensure that the applicable requirements have been met?	Part 3, 1.6.6.2 k); 1.6.7.2 k); 1.6.8.2 k)

A.4.14 Control of Measurement and Test Equipment

	Part 3, 1.6; ASME NQA-1
(a) Does the Applicant's Quality Assurance Program provide for the control of measurement and test equipment?	Part 3, 1.6.6.2 l); 1.6.7.2 l); 1.6.8.2 l)
(b) Does the program provide that all measurement and test equipment shall be calibrated in conformance to known national standards, where those standards exist, or with the device Manufacturer's recommendations?	Part 3, 1.6.6.2 l); 1.6.7.2 l); 1.6.8.2 l)

A.4.15 Quality Records

	Part 3, 1.6; ASME NQA-1
(a) Does the Applicant's Quality Assurance Program provide that it is the owner's responsibility to designate which records are to be maintained?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(b) Has the Applicant provided a system in accordance with the owner's requirements for maintaining the appropriate records for the repair/replacement activity?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(c) Has the Applicant established a system for maintenance of records for material, manufacturing, examination, and test data taken before and during the repair/replacement activity?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(d) Are the quality records, including procedures, specifications, and drawings used, fully identified by pertinent traceability including item identification numbers, revision numbers, and issue dates?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(e) Are there provisions that quality records for personnel qualifications, procedures, and equipment related to the repair/replacement activities are maintained?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(f) Are there provisions that quality records shall be maintained and stored and suitably protected from deterioration and damage while in the Applicant's care?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(g) Is there a provision in the Applicant's Quality Assurance Program for correcting or amending quality records that satisfy the owner's requirements?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(h) Does the Applicant's Quality Assurance Program provide for transferring records to the owner when requested?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(i) Does the Applicant's Quality Assurance Program for the system used for maintaining quality records, i.e., index, location, and contents, describe who is responsible for this activity?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
(j) Does the Applicant's Quality Assurance Program provide that the quality records shall be maintained for a minimum period of five years?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)

(k) Does the Applicant's Quality Assurance Program provide that the original completed Form NR-1 or Form NVR-1 shall be registered with the National Board?	Part 3, 1.6.6.2 m); 1.6.7.2 m); 1.6.8.2 m)
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A.4.16 Examination and Test Status

	Part 3, 1.6; ASME NQA-1
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(a) Does the Applicant's Quality Assurance Program provide measures to identify examination and test status of parts, items, or components during the repair/replacement activity?	Part 3, 1.6.6.2 n); 1.6.7.2 n); 1.6.8.2 n)
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(b) Does the examination and test status system provide for the identification of acceptable and nonacceptable items?	Part 3, 1.6.6.2 n); 1.6.7.2 n); 1.6.8.2 n)
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(c) Are there provisions for status indicators to identify conforming and nonconforming components, parts, and items, and for removing these indicators by authorized personnel when nonconforming conditions have been resolved?	Part 3, 1.6.6.2 n); 1.6.7.2 n); 1.6.8.2 n)
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A.4.17 Nonconforming Material or Items

	Part 3, 1.6; ASME NQA-1
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(a) Has the Applicant provided in the Quality Assurance Program for establishing the control of material and items that do not comply to the requirements specified, to prevent their inadvertent use for repair/replacement activities?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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(b) Has the system defined what constitutes a nonconformance during receiving and during the repair/replacement activities?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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(c) Does the system provide measures for identifying and controlling the proper installation of items to prevent a nonconformance?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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(d) Does the system provide rules for identifying, documenting, segregating, and providing a disposition that will resolve the nonconformance?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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(e) Does the system provide that the individual responsible for the nonconformance system has the authority to provide a disposition that will satisfy the applicable quality standards?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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(f) Are there provisions that control further processing of defective items, pending a decision on the nonconformance until resolution?	Part 3, 1.6.6.2 o); 1.6.7.2 o); 1.6.8.2 o)
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A.4.18 Corrective Action

	Part 3, 1.6; ASME NQA-1
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(a) Has the Applicant provided requirements in the Quality Assurance Program for corrective action to be taken for conditions adverse to quality? Conditions to be promptly identified and corrected could include failures, malfunctions, deficiencies, or deviations in material and/or equipment.	Part 3, 1.6.6.2 p); 1.6.7.2 p); 1.6.8.2 p)
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(b) Has the Applicant established in the corrective action procedure that significant conditions adverse to quality shall ensure that the cause of these conditions can be determined and corrected to prevent repetition?	Part 3, 1.6.6.2 p); 1.6.7.2 p); 1.6.8.2 p)
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(c) Has the Applicant provided that significant conditions adverse to quality shall be documented? The documentation used shall identify the condition and the appropriate corrective action taken.	Part 3, 1.6.6.2 p); 1.6.7.2 p); 1.6.8.2 p)
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(d) Has the Applicant provided in the corrective action procedure that the condition and corrective action for significant conditions adverse to quality shall be reported to the appropriate levels of management?	Part 3, 1.6.6.2 p); 1.6.7.2 p); 1.6.8.2 p)
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(e) Has the Applicant provided that the corrective action procedure shall also apply to subcontractors?	Part 3, 1.6.6.2 p); 1.6.7.2 p); 1.6.8.2 p)
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A.4.19 Audits

	Part 3, 1.6; ASME NQA-1
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(a) Has the Applicant provided in the Quality Assurance Program for comprehensive, planned, and periodic audits of their program to ensure compliance with the Quality Assurance Program and for determining the effectiveness of the repair/replacement program?	Part 3, 1.6.6.2 q); 1.6.7.2 q); 1.6.8.2 q)
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(b) Are there provisions in the Applicant's Quality Assurance Program that audits shall be performed in accordance with approved written procedures or checklists by auditors not having direct responsibility for the area being audited?	Part 3, 1.6.6.2 q); 1.6.7.2 q); 1.6.8.2 q)
(c) Has the Applicant provided in the audit procedure that the results of an audit shall be documented by the audit personnel assigned and the results are available for management's review?	Part 3, 1.6.6.2 q); 1.6.7.2 q); 1.6.8.2 q)
(d) Does the Applicant provide for follow-up audits in areas where deficiencies were reported?	Part 3, 1.6.6.2 q); 1.6.7.2 q); 1.6.8.2 q)
(e) Has the Applicant provided that audit reports are to be made available to the ANI?	Part 3, 1.6.6.2 q); 1.6.7.2 q); 1.6.8.2 q)

A.4.20 Authorized Nuclear Inspector

	Part 3, 1.6; ASME NQA-1
(a) Does the Applicant's Quality Assurance Program require an AIA accredited in accordance with NB-369, <i>Accreditation of Authorized Inspection Agencies (AIA) Performing Inservice Inspection Activities</i> ?	Part 3, 1.6.6.2 r); 1.6.7.2 r); 1.6.8.2 r)
(b) Does the Applicant's Quality Assurance Program provide for inspection activities to be performed by an ANI in accordance with the <i>Rules for Commissioned Inspectors</i> , NB-263?	Part 3, 1.6.6.2 r); 1.6.7.2 r); 1.6.8.2 r)
(c) Has the Applicant provided for free access to areas used for possessing and implementing the repair/replacement activities? This access is extended to the ANIS.	Part 3, 1.6.6.2 r); 1.6.7.2 r); 1.6.8.2 r)
(d) Does the Applicant provide documents, procedures/instructions and drawings to the ANI, for reviewing repair/replacement methods, establishing appropriate inspections points, and verifying Code during compliance for repair/replacement activities?	Part 3, 1.6.6.2 r); 1.6.7.2 r); 1.6.8.2 r)8.5.1 r)

A.4.21 Interface With Owner's Repair/Replacement Program

	Part 3, 1.6.9
(a) Does the Applicant's Quality Assurance Program provide for acceptance of the repair/replacement program by the applicable Jurisdiction and the owner's ANII?	Part 3, 1.6.9
(b) Does the Applicant's Quality Assurance Program satisfy the applicable requirements of Section XI of the <i>ASME Boiler and Pressure Vessel Code</i> ?	Part 3, 1.6.9
(c) Does the Applicant's Quality Assurance Program provide for documenting the completed repair/replacement activities on the National Board's NR-1 or NVR-1 Forms, as applicable?	Part 3, 1.6.9
(d) Are there provisions in the Quality Assurance Program that completed NR-1 or NVR-1 Forms, as applicable, are signed by a representative of the Applicant and countersigned by the ANI?	Part 3, 1.6.9
(e) If the repair/replacement activities are for a modification to the original design of the component, item, or part, does the Applicant identify on the NR-1 or NVR-1 Form, as applicable, the organization that is responsible for satisfying the Owner's Design Specification?	Part 3, 1.6.9
(f) Are there provisions in the Applicant's Quality Assurance Program to provide a copy of the NR-1 or NVR-1 form to the National Board?	Part 3, 1.6.9
(g) Are there provisions in the Applicant's Quality Assurance Program that nameplate/stamping be provided for each nuclear component unless the Owner's Design Specification requires otherwise?	Part 3, 1.6.9

APPENDIX B

National Board *Certificate of Authorization* Resources

B.1 “R” Stamp *Certificate of Authorization* Program

The National Board offers the *Certificate of Authorization* and “R” symbol stamp for the repair and/or alteration of boilers, pressure vessels, and other pressure-retaining items. Requirements are described in [NB-415, Accreditation of “R” Repair Organizations \(en Español\)](#).

B.1.1 Prerequisites/Application

Organizations seeking a National Board “R” *Certificate of Authorization* must complete [NB-12, Application for the National Board “R” Certificate of Authorization](#) and:

1. have and maintain an inspection agreement with an [authorized inspection agency](#);
2. have a written Quality System that complies with the requirements of the current Edition of the *National Board Inspection Code* (NBIC) and includes the expected scope of activities;
3. have the current Edition of all parts of the [NBIC](#), (organizations have the option of using either a printed version or an electronic version, including a subscription from a National Board licensed reseller, to fulfill this requirement);
4. have available a copy of the Code of Construction appropriate for the intended scope of work.

Prior to issuance of a National Board “R” *Certificate of Authorization*, the organization and its facilities are subject to an onsite review of its Quality System.

B.1.2 Review Team

The Review Team, as a minimum, shall consist of a representative(s) from the Authorized Inspection Agency (AIA) in accordance with [NB-263, RCI-1, Rules for Commissioned Inspectors](#) and the National Board member Jurisdiction where the organization is located.

If the Jurisdiction elects not to perform the Review, or where there is no Jurisdiction, or where the Jurisdiction is the organization’s AIA, the National Board will represent the Jurisdiction. At the Jurisdiction’s discretion, the Jurisdiction may choose to be a member of the Review Team if the Jurisdiction chooses not to be the Team Leader.

The Review Team’s responsibility is to document any findings and report them to the National Board along with a recommendation concerning issuance of a *Certificate of Authorization*.

B.1.3 Demonstration

A Review Team will conduct an evaluation of the company’s Quality System Program. The company must demonstrate sufficient implementation of the Quality System to provide evidence of the company’s knowledge of welding, nondestructive examination, postweld heat treatment and other repair or alteration activities performed as applicable for the requested scope and type of work identified within the Applicant’s Written Quality System.

The evaluation of the Quality System Program must include a demonstration of welding, if included within the scope of activities applied for. The implementation demonstration must include any ongoing or current repair/alteration work at the time of the Review, otherwise, a mock-up, or a combination of a mock-up and non-repair/alteration work may be used.

B.1.4 Changes/Revisions

Organizations holding an “R” *Certificate of Authorization* who change ownership, name, location, and/or scopes at any time other than the joint review must submit an [NB-397, Certificate of Authorization Revision Request](#), signed by both a company representative and the AIA representative accepting the change(s), along with a copy of their Quality System Manual cover sheet showing the change(s). When the changes are made at the time of the joint review, the review team will verify the changes with the Applicant and revise the application to be submitted by the Team Leader with the Qualification Review Report.

The appropriate Jurisdiction will be notified, and that Jurisdiction may require a Joint Review of the facilities and Quality System Manual.

If there are questions on the certification program, please [Contact Us \(Accreditation\)](#) or email/fax the Accreditation Department.

B.1.5 Renewals

Organizations wishing to renew their “R” *Certificate of Authorization* will complete the application process as described in B.1.1 above. In order to process the renewal of an “R” certification before the expiration date, the application and renewal fee must be received at least six months prior to the expiration date of the current Certificate.

IF THE RENEWED CERTIFICATE IS ISSUED AFTER EXPIRATION, AND NO CERTIFICATE EXTENSION WAS ISSUED, THERE WILL BE A LAPSE IN THE ORGANIZATION’S ABILITY TO PERFORM ANY REPAIR/ALTERATION ACTIVITY BETWEEN THE EXPIRATION DATE AND THE RENEWAL ISSUANCE DATE. IF THE CERTIFICATE IS RENEWED MORE THAN 180 DAYS PAST EXPIRATION, A NEW “R” NUMBER MAY BE ASSIGNED.

The application for renewal may be obtained from the National Board website (www.nationalboard.org) and submitted via email to repairstamp@nationalboard.org. Upon receipt of the application, we will send a notification email to the member Jurisdiction with a copy to the company. If the Jurisdiction where the shop is located elects to perform Reviews, it will then be the company’s responsibility to contact the Jurisdiction to schedule the Review.

NOTE: If the company has changed their AIA since the last renewal and has not notified the National Board of this change, the company will need to submit a copy of their AIA Contract/Agreement cover page along with the application.

If the company is not planning to renew the National Board “R” *Certificate of Authorization*, they are to notify the National Board. If applicable, it is also important to notify the National Board if the company is not renewing the ASME *Certificate(s) of Authorization*.

B.1.6 “R” Form Registration

Any organization that holds a valid “R” *Certificate of Authorization* is authorized to register “R” Forms with the National Board.

All “R” Forms may be registered with the National Board. If the original *Manufacturer’s Data Report* was registered with the National Board, the “R” Form is attached to the original data report, thus forming a package showing the Code responsibility for all work performed on the vessel.

Some Jurisdictions require all “R” Forms be registered with the National Board. It is the responsibility of the “R” Stamp Holder to verify the jurisdictional requirements for the location the pressure-retaining item is installed.

When the original *Manufacturer's Data Report* was registered with the National Board, it is required that all Form R-2's (Report of Alteration) be registered with the National Board.

The National Board recommends the Electronic Data Transfer (EDT) system for the completion and registration of "R" Forms. It is an interactive document management system that both simplifies and expedites the process of registering reports, conveniently accomplished through the Internet. The entire process is completed electronically with just a few clicks of a button. The NBIC R-1 and R-2 Forms are available through EDT.

B.2 *Manufacturer's Data Report Registration*

Registration of an item with the National Board involves the Manufacturer submitting an original *Manufacturer's Data Report* to the National Board for permanent retention. Registration is more than record retention; it represents the culmination of a three-step process, including the design and construction of an item in accordance with The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (*ASME BPV Code*), the inspection by a National Board Commissioned Inspector, and the final documentation certifying compliance with the *ASME BPV Code*.

Any Manufacturer meeting the requirements of [NB-264, *Criteria for Registration*](#) may become authorized to register. There is no charge to become authorized to register, but there is a fee for each item registered.

To apply for authorization to register, please go to the online [Application for Authorization to Register](#).

Manufacturers may register printed original data reports or may set up a National Board [Electronic Data Transfer \(EDT\)](#) account and register items electronically.

A link to [A Brief History of National Board Registration](#) is included for reference. The [NB-11, *Guide for Completing Data Reports*](#) is a useful reference tool.

A listing of Manufacturers and repair organizations authorized to register is presented on <https://www.nationalboard.org/> in a searchable format in the [Manufacturer & Repair Directory](#).

B.3 *ASME BPV Code Data Report Forms/ NBIC "R" Forms Revisions*

- (a) New Editions to the *ASME BPV Code* and NBIC data report forms become mandatory six months after issue on January 1st of the following year.
- (b) Items manufactured/repaired/altered must be documented on current forms.
- (c) All data report forms submitted to the National Board for registration on outdated forms will be returned for correction.
- (d) Data report forms submitted to the National Board for registration must also meet the following requirements:
 - (1) Data report forms must be in the exact format and have the same content as those found in the *ASME BPV Code* and the NBIC.
 - (2) Two-sided data report forms (BPV Section IV forms - the second page says "Back") must be submitted as such. It is not acceptable to submit these data report forms on two separate pages.
 - (3) The header must be completed on each page of data report forms that will be submitted on multiple pages (example: U-1, U-2, P-3). There must also be space for the company representative and authorized inspector to initial each page.
 - (4) All data report forms and their content must comply with the National Board's font size requirements. The National Board requires the use of at least a 6 point font size in creating data report forms and at least an 8 point font size on any technical information provided on the data report form (Arial 8 or comparable size in any other font style). The only exception to this will be in sections which have a table format (example: heads and nozzles). In these sections, a 7 point font size will be acceptable if the data remains legible.
 - (5) Data report forms submitted for registration must have original signatures. Referenced *Partial Data Report*

attachments may be legible copies. All data report forms, including attachments (supplemental sheets and *Partial Data Report* forms), must be legible. The legibility of data reports is subject to review/acceptance by National Board staff.

- (6) In order to minimize the impact of the recent revisions, consideration should be given to using the National Board's Electronic Data Transfer (EDT) System for submitting data reports for registration. EDT simplifies the entire process, eliminates the return of data reports for nonconformance issues and ensures the most up-to-date forms.

Please contact the National Board for more information regarding EDT.

APPENDIX C

ASME Certificate of Authorization Resources

C.1 ASME Resources

The "Downloadable Resources" link below can be used as the main link to access all forms, notices, checklists, policies and procedures mentioned in this appendix. [Downloadable Resources](#)

Information specific to the Boiler and Pressure Vessel Certification Program can be found in the following links:

[Boiler and Pressure Vessel Certification](#)

Procedures [Conduct of Conformity Assessment Activities](#)

[ASME Policy on Confidentiality and Due Process](#) – Rights the Applicant has during the Review/survey process

C.2 ASME Accreditation and Certification Agreement Form

All Applicants are required to sign the [Accreditation and Certification Agreement Form](#), otherwise known as the "Agreement Form".

ASME requires that a Company's legal name appear on the signed Agreement Form submitted to ASME at the time the Application is submitted.

A copy of the signed Agreement Form submitted by the Applicant to ASME can be found on-line in the Applicant's portal and for the assigned Team Leader through the Team Leader portal, under the "Pre-Certification" tab.

The Team Leader, at the entrance meeting, will review the Application submitted by the Applicant and the signed Agreement Form contained in the portal to ensure that the legal name appearing on the signed Agreement Form is the same name that will be appearing on the *Certificate(s) of Authorization* and is the current legal name of the Applicant.

Where a change has been made to the legal name such that the legal name is different than the legal name appearing on the signed Agreement Form contained in the Team Leader's portal, the Applicant MUST submit a new signed Agreement Form containing the correct legal name to the Team Leader prior to the exit interview.

C.3 Change in Contact or Contact Information

To view instructions on changing the primary contact information, see [How to Change Primary Contact Information](#).

All ASME correspondence is with the individual who has been identified by the Applicant/Certificate Holder as the primary contact. It is important that the Applicant/Certificate Holder inform ASME immediately of any changes with the contact information.

C.4 Certificate Extension Requests

To view the notice on requesting an extension of the expiration on a Certificate, see [Notice on Requests for Extension of Certificate of Expiration Date](#).

ASME requires that the Applicant for renewal submit their completed Application package to ASME within at least six months prior to the expiration dates on your Certificate(s).

An application package is considered complete when ASME is in receipt of all application forms which have been properly completed, associated fees, signed Agreement Form, and when applicable, confirmation of a signed service contract from the AIA of Record.

In all cases, an extension fee will be charged to the Certificate Holder when the Certificate Holder has requested an extension and the completed application package is not received prior to the six month cut-off date.

In all cases where the Certificate has expired prior to the Review being conducted, no extension will be granted.

For situations not covered in the “Notice on Requests for Extension of Certificate Expiration Date” you will need to contact ASME Conformity Assessment staff.

C.4.1 Expired Certificate(s) - Re-Issuance of Expired Certificate(s)

ASME’s current policy requires that Certificate(s) that have expired less than four months from the date the renewal Review is started will be automatically renewed with the expired Certificate number(s), and with an expiration date three years from the expiration date on the expired Certificate(s).

A Certificate Holder may request that they maintain their previous Certificate number(s) for up to six months from the date they have expired (at the time the Review has started), upon a request made to either ASME staff or the Team Leader at the time of the Review. In these cases, where the request to keep the Applicant’s previously issued Certificate number(s) is accepted by ASME, the expiration date on these Certificate(s) will be three years from the expiration date of the expired Certificate(s).

C.4.1.1 Expired Certificate(s) - Previous Code Activity

Where the Certificate Holder had Certificates that expired prior to the renewal Review being conducted, the Team Leader shall list the expired and active Certificate number(s) and expiration date in Part I of the QRR. Code activity (number of Code items stamped) since the last Review for each expired and active Certificate shall be listed in Part II of the QRR under the Section titled “Code Activity”.

C.4.2 Joint Review Terminated by Applicant

While the Joint Review is being conducted, the Applicant has the right to terminate the Review.

The Team Leader will require the Applicant to submit a formal letter to ASME requesting that the Review be terminated. At the time that the request to terminate the Review is made, the Team Leader will immediately stop all activities related to conducting the Review. This will result in a partially completed QRR form, that along with the letter terminating the Review, will be submitted to ASME staff.

At the time the Applicant informs the Team Leader that they are terminating the Review, the Team Leader will need to inform the Applicant that they have forfeited the right to due process OR to request an extension.

C.5 Additional Buildings (Within one mile (1.6 km) of the Codeshop)

To view information and obtain an application to permit an additional building to perform code work under a current Certificate, see [Procedure For Adding Additional Building Location To Current Certificate](#).

ASME Policy will allow a Certificate Holder to request use of an additional building to perform code work when the additional building is one mile (1.6 km) or less from the Code shop address identified on the *Certificate of Authorization*. The distance requirement is always determined by the radial distance from the Code shop address identified on the *Certificate of Authorization*.

C.5.1 Renewing *Certificate of Authorization* with Continued Use of Additional Buildings

Each time an Applicant applies for the renewal of their Certificate(s) and the additional buildings are still being used by the Code shop, the Applicant will need to fill out an Additional Building Application and submit the Additional Building Application Form with the Application for Renewal, as additional time may need to be scheduled to allow for the Team Leader to have sufficient time to complete the Review of the Code facility.

If there is insufficient time to conduct the Review of the additional building(s), at the discretion of the Team Leader, the Team Leader may request the assigned AIS to conduct an audit of the additional building(s) and for the assigned AIS to submit an audit report along with the Additional Building Application Form to ASME.

C.6 Temporary Locations

To view instructions and application to perform Code work at a temporary location under a current *Certificate of Authorization*, see [BPV Temporary Location Used by Certificate Holders](#).

Should a Certificate Holder need the use of another location temporarily to fulfill a job order(s), ASME will consider granting use of the temporary location for a one year period not to exceed the current expiration of its *Certificate of Authorization*. A Certificate Holder can request use of only one temporary location for a maximum of two years over a three year period. Should the first interval of use of the temporary location expire in less than a year due to an approaching expiration date of the current Certificate, use of the temporary location for the balance of the 12 month period will be granted upon the successful renewal of the Certificate. The Team Leader is required to make a remark on the need for the continued use of the temporary location for the remaining balance of the 12 month period under the Remarks Section in Part I of the QRR; the continued use for the remaining balance is to be part of the Team's recommendation.

Should the Certificate Holder need use of the temporary location for an additional and final year, another "Application for Temporary Location" is to be submitted. At the discretion of the Team Leader, should this temporary location application coincide with the submittal of renewal application of one's *Certificate of Authorization*, and be in close proximity to the code shop, the Team Leader may extend the Review to cover the temporary location for its last and final additional year of use; the continued use of the temporary location shall be a part of the Team's recommendation.

If the "Application for Temporary Location" form is completed and provided to the Team Leader at the time of the renewal Review, the Team Leader is to process the application as a "revised" application and upload the revised application through the Team Leader's portal under the Pre-Certification tab. Should the Team Leader be unable to extend the renewal Review to cover the temporary location, the Certificate Holder may request to have its assigned Authorized Inspector Supervisor (employed by the AIA of Record) perform an audit and to submit the audit report to ASME. The Team Leader is required to make a remark, under the Remarks Section in Part I of the QRR, on the status of the temporary location and indicate whether the temporary location was covered under the Review or whether the Certificate Holder will be requesting its AIS to conduct a temporary location audit.

C.7 Corporate Manuals

ASME does not allow the use of Corporate QS Manuals by Certificate Holders who apply for *BPV Code* non-nuclear certification.

Each Code shop must have their name and address on the QS Manual stating the name and address of the Code shop being reviewed.

The section of the QS Manual indicating the person at the Code shop signing the statement of authority should be signed off by the senior person at the Code shop, and all changes made to the QS Manual should be approved by the AI or AIS assigned to the Code shop.

C.8 Team Recommendation (Part IV of the QRR)

ASME allows Teams to make either a request to have ASME consider a new Certificate scope or to make a recommendation for any action other than issue.

C.8.1 New Certificate Scopes

In cases where the Applicant does not feel that the currently approved scope adequately addresses the type of Code activities being performed under the requested Certificate, the Applicant can make a request to the ASME Team Leader to have a new Certificate scope developed to address the Code activities being performed by the Applicant. The Team Leader will make a determination as to whether a new Certificate scope should be issued.

Issuance of a Certificate with a new scope statement will be delayed as ASME will need additional time to determine whether the request is appropriate and if the scope statement being recommended by the Team is in alignment with the Code requirements.

GLOSSARY

Terms as used throughout this document are defined below. Terms not listed below shall meet the definitions as listed in the ASME document: Procedures Conduct of Conformity Assessment Activities

Applicant – An organization applying for any form of ASME or National Board accreditation/certification.

Audit – A documented evaluation performed to verify, by examination of objective evidence, that those selected elements of a previously approved Quality Management System have been developed, documented, and implemented in accordance with specific requirements.

Authorized Inspection Agency (AIA) –

Inservice: An Authorized Inspection Agency is either:

- a) a Jurisdictional Authority as defined in the *National Board Constitution*; or
- b) an entity that is accredited by the National Board meeting NB-369, *Accreditation of Authorized Inspection Agencies (AIA) Performing Inservice Inspection Activities*; NB-371, *Accreditation of Owner-User Inspection Organizations (OUIO)*; or NB-390, *Accreditation of Federal Inspection Agencies (FIA)*.

New Construction: An Authorized Inspection Agency is one that is accredited by ASME and the National Board meeting the qualifications and duties of ASME QAI-1, *Qualifications for Authorized Inspection* and NB-360, *National Board Acceptance of Authorized Inspection Agencies (AIA) Accredited by ASME*, respectively.

Code – As used throughout this Guide, both the *ASME BPV Code* and the NBIC shall be referred to as “Code” as appropriate.

Code Work – Any controlled construction activity performed under a *Certificate of Authorization* issued by ASME or the National Board with the completed item, part, or service certified by the organization identified on the *Certificate of Authorization*.

Construction – An all-inclusive term comprising material, design, fabrication, repair, alteration, examination, inspection, testing, certification, and overpressure protection.

Demonstration – A program of making evident by illustration, explanation, and completion of tasks documenting evaluation of an Applicant’s ability to perform Code activities, including the adequacy of the Applicant’s Quality Management System, and by a review of the implementation of that program at the address of record and/or work location.

Inspector – An Authorized Inspector or Repair Inspector holding a National Board Commission as appropriate.

Inspector Supervisor – An Authorized Inspector Supervisor holding a National Board Commission, a Repair Inspector Supervisor holding a National Board Commission, or a Technical Manager, as appropriate.

Observer – A Team participant who is authorized by ASME and/or the National Board to attend a Review, survey, or interview to observe the Conformity Assessment activities of the Team, but who shall not evaluate an Applicant’s quality program (unless the participation is for training purposes and is under direct supervision of a qualified individual), and neither contributes to the development of the Team's consensus recommendation nor votes on the consensus recommendation that is to be submitted to ASME and/or the National Board.

Quality Management System – An all-inclusive term covering various types of quality programs which includes a Quality Control System. An overall system comprised of a Quality System Manual, procedures, instructions, forms, and other documents to control code activities and verify the achievement of quality requirements as specified by the Code.

Review – The evaluation of an Applicant’s Quality Control System, including a demonstration of compliance with Code requirements covered by the scope of the Certificate(s) being applied for, including as applicable, design, material, fabrication, repair, alteration, examination, testing, inspection, and certification.

Team – Refers collectively to those individuals authorized to participate in Team Activities consistent with their assigned role, which may be Team Leader, Team Member(s), Auditor(s), AIA representative(s), Jurisdictional Authority, and Observers.

Team Leader – An ASME Designee or National Board Team Leader or Representative (as appropriate) who is also the Team Member who has overall responsibility for the conduct of the survey, review, audit, investigation or interview.

Team Member – refers to individuals authorized by ASME to participate on a Team and are limited to the Team Leader, Auditor(s), AIA representative(s) and Jurisdictional Authority representatives.



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