

**GUIDE  
FOR  
ASME REVIEW TEAMS  
FOR  
REVIEW OF APPLICANTS  
FOR  
ASME CERTIFICATES OF AUTHORIZATION  
(A, M, PP, S, E, V, HV, H, HLW, H (Cast Iron/Cast Aluminum),  
UD, UV, UV3, U, UM, U2, U3, RP, T, TD, TV)**

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## INTRODUCTION

This Guide is prepared for the use of ASME Review Teams. It is not intended to replace or interpret the requirements of the ASME Boiler and Pressure Vessel Code (B&PVC).

In addition, to assist the ASME Review Team, this Guide will be provided to Applicants for ASME Certificates of Authorization for their use in cross referencing the paragraphs in their Quality Control (QC) Manual with the applicable control requirements of the Code, and as a guide as to what is expected for a demonstration of the QC System.

This Guide is based on Section I, Section IV, Sections VIII Divisions 1, 2 and 3, Section X, and Section XII of the B&PVC. The Guide is subject to revision based on changes made in the aforementioned Sections in the B&PVC.

A Review must cover a QC Manual and its implementation. It is recognized that the scope of work, QC Manual, and Manual implementation will vary from Applicant to Applicant. Therefore, the ASME Review Teams are advised that all aspects of this Guide may not apply and that this Guide may not outline all possible aspects of each Review. The Manual need not follow the format of this Guide.

Questions of possible need for Code interpretation raised by Review Teams shall be submitted to the ASME Director, Accreditation and Certification. When a request for an interpretation is to be submitted by an Applicant, the Team Leader shall advise the Applicant that all such inquiries must be submitted to the Secretary, Boiler and Pressure Vessel Committee, and that a copy of the inquiry and reply should be provided by the inquirer to the Applicant's Authorized Inspection Agency and cognizant Jurisdiction, if appropriate.

Suggestions for revisions or clarification to this Guide should be directed to the ASME Director, Accreditation and Certification.

## REVIEW DEMONSTRATION

The purpose of the Review Demonstration is to evaluate the Applicant's Quality Control System (QCS) and its implementation. For evaluation of the QCS, the Applicant must demonstrate to current Code rules sufficient administrative and fabrication functions of the QCS to show that they have the knowledge and ability to produce the Code items typical of those covered by the QCS. It is expected that fabrication functions be demonstrated using typical Code work. However they may be demonstrated using current work, a mock-up, or a combination of the two. Any current Code work ongoing at the time of the joint review is subject to the Team's review.

While the Applicant must address each element of the QCS in the Code, the Applicant need only demonstrate those elements within the intended scope of activities that apply to their program.

Demonstration Item<sup>1</sup>: An Applicant<sup>2</sup> for a single Certificate must demonstrate on an item that will be fabricated for the requested type and scope of Certificate of Authorization. The demonstration must be an implementation of ALL aspect of the QC System and is to include a demonstration of actual welding if welding is included in the scope of Code activities.

For Applicants requesting multiple stamps, it is not necessary to have a demonstration item with design calculations for each Code Section. An item fabricated to any one of the requested Certificates may be used as the demonstration item. However, if the demonstration item is not to the most stringent Code requirements, the Applicant must provide additional calculations or another documentation package that contains Code calculations to the most stringent Code requirements and administrative documentation to sufficiently demonstrate compliance with all aspects of the company's QC System.

For example, an Applicant for U and U2 Certificates could demonstrate their QCS on a Section VIII, Div. 1 pressure vessel including design. However, due to the nature of Section VIII, Div. 2 requirements, in addition to the Section VIII Div. 1 demonstration, an Examination and Inspection Plan and Manufacturer's Design Report with supporting User Design Specification in accordance with Section VIII, Div. 2 would be prepared and presented. Certification of the Design documents by an Engineer meeting the criteria as defined in Section VIII, Div. 2 would also need to be demonstrated.

If computer calculations are to be used, the Applicant shall demonstrate that the computer program has the capability of producing acceptable calculations.

If the demonstration item is based upon current work that is being fabricated to a previous Code edition, the Applicant shall address changes in the Code that would require different actions in the demonstrations to be in compliance with the current Code.

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<sup>1</sup> The demonstration item shall be based on the latest Code Edition/Addenda in effect at the time a complete Application is received by ASME.

<sup>2</sup> This does not apply to an Engineering Contractor under Section I. For an Engineering Contractor Organization under Section I, without a fabricating facility, a physical demonstration item is not required. However, a design specification must be provided as well as additional administrative functions to demonstrate compliance with the organization's QCS.

## QUALITY SYSTEM REVIEW CHECKLIST

Item No.	Quality Element and Sub-elements	QC Manual References
1.	<p><b><u>GENERAL QUALITY CONTROL SYSTEM REQUIREMENTS</u></b></p> <p>(a) QC System is documented in detail in a QC Manual that addresses all requirements of the applicable Code Section and includes:</p> <ul style="list-style-type: none"> <li>(1) a cover sheet that contains the company name and physical address as it will appear on the requested Certificate of Authorization;</li> </ul> <p>Note: The cover sheet may also contain the effective date of the QC Manual, mailing address, phone number or other information desired by the Certificate Holder or Applicant.</p> <ul style="list-style-type: none"> <li>(2) a brief description of the products being fabricated and/or work being accomplished under the Code including applicability of QC System to shop activities, field activities or both;</li> <li>(3) control features to demonstrate Code compliance;</li> <li>(4) Manual revision control system;</li> <li>(5) provision for review and approval of QC Manual to maintain it current;</li> <li>(6) provision for submittal of QC Manual revisions to the Authorized Inspector (AI) (ASME Designee for H (Cast Iron and Cast Aluminum), T Class 3, or ASME Designated Organization for V, HV, UD, UV, UV3, TD and TV) for acceptance prior to implementation including timely updating of all copies to reflect accepted revisions; and</li> <li>(7) provision for the custody and control of the Certification Mark to prevent loss or unauthorized use.</li> </ul> <p>(b) In the case where the QC Manual exists in more than one language, at least one version is in English and identified as the authoritative version.</p> <p>Note: A glossary of terms is desirable from the standpoint of clarity if abbreviated titles of personnel and control documents are used throughout the QC Manual. This, however, is not mandatory.</p>	
2.	<p><b><u>AUTHORITY AND RESPONSIBILITY</u></b></p> <p>(a) The authority and responsibility for QC by management is documented.</p> <p>Note: In practice, a Statement of Policy and Authority must be signed by a senior company official responsible for Code activities (e.g., President, Vice President, Plant Manager, etc.).</p>	

## QUALITY SYSTEM REVIEW CHECKLIST

Item No.	Quality Element and Sub-elements	QC Manual References
	<p>(b) The authority and responsibility of those in charge of the QC System are clearly established and documented.</p> <p>(c) Persons performing QC functions have sufficient and well defined responsibility, the authority, and the organizational freedom to identify quality control problems and to initiate, recommend and provide solutions.</p>	
3.	<p><b><u>ORGANIZATION</u></b></p> <p>(a) An organization chart showing the relationship between management and engineering, purchasing, manufacturing, production, field assembling, field construction, inspection and quality control, as applicable, exists and reflects the actual organization.</p> <p>Note: The purpose of this chart is to identify and associate the various organizational groups with the particular function for which they are responsible. The Code does not intend to encroach on the Certificate Holder's right to establish and, from time to time, alter whatever form of organization the Certificate Holder considers appropriate for their Code work.</p>	
4.	<p><b><u>DRAWING, DESIGN CALCULATIONS, AND SPECIFICATION CONTROL</u></b></p> <p>(a) Procedures exist which assure that the latest applicable drawings, design calculations, specifications and instructions, required by the Code, as well as authorized changes, are used for manufacture, assembly, examination, inspection and testing. Procedures include provision for:</p> <ol style="list-style-type: none"> <li>(1) review of customer supplied documents for Code compliance;</li> <li>(2) the preparation, review, approval and distribution of drawings, calculations, and specifications;</li> <li>(3) [Applicable to U2 and U3 only] use of the user's Certified Design Specification including authorized changes;</li> <li>(4) [Applicable to U2 and U3 only] providing the Manufacturer's Certified Design Report including authorized changes;</li> <li>(5) [Applicable to U2 and U3 only] certification of Design Specification and Design Report by an engineer meeting the criteria defined in Section VIII Div. 2 and/or Div. 3;</li> </ol>	

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	<p>(6) [Applicable to V, HV, UD, UV, UV3, TD and TV only] new capacity certification tests are conducted when changes in design are made which affect flow path, lift or performance characteristics; and</p> <p>(7) [Applicable to T Class 3 only] provisions for Design Certified Engineer.</p>	
5.	<p><b><u>MATERIAL CONTROL</u></b></p> <p>(a) Procedures for material control exist to assure that the material received is properly identified and has documentation, including, as applicable, required material certifications or material test reports, to satisfy Code requirements as ordered.</p> <p>(b) The material control system assures that only the intended material is used in Code construction. For Section XII only, material shall satisfy the applicable modal appendices requirements.</p> <p>(c) If substitution of materials is allowed, the applicable procedures for control of this activity are documented, including designation of the individual authorized to approve substitutions.</p> <p>(d) The title of the individual responsible for identifying the need for material test reports or certificate of compliance is designated.</p> <p>(e) The title of the individual responsible for performing a receiving inspection of Code materials is designated.</p> <p>(f) Information to be provided to the receiving inspector concerning the characteristics to be checked is documented.</p> <p>(g) A procedure exists for handling materials that are found to be nonconforming at receiving inspection.</p> <p>(h) If further material testing is required to be performed at receiving inspection or during manufacturing operations, the applicable procedures for control of this activity are documented.</p> <p>(i) Measures are established to assure the proper marking, handling and storage of materials.</p>	

## QUALITY SYSTEM REVIEW CHECKLIST

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6.	<p><b><u>EXAMINATION AND INSPECTION PROGRAM</u></b></p> <p>(a) Fabrication operations, including examinations and bursting test procedures (for H Cast Iron and Cast Aluminum) are described in sufficient detail to permit the Authorized Inspector (AI) (or the Certificate Holder in the case of H (Cast Iron and Cast Aluminum), V, HV, UD, UV, UV3, TD and TV) to determine at what stages specific inspections are to be performed. Specifically:</p> <ol style="list-style-type: none"> <li>(1) Provisions for the use of checklists, process sheets, travelers, etc., for listing of examinations and tests to be performed and for designation of inspection points;</li> <li>(2) Such checklists, process sheets, travelers, etc, are made available to the Authorized Inspector prior to the start of fabrication; and</li> <li>(3) [Applicable to RP and UIG] A basic production flow diagram exists and includes in-plant inspection and check-off points and means of recording the same.</li> </ol> <p>(b) Material test reports or certificates of compliance, examination reports, test records, and other fabrication records are available to the Authorized Inspector.</p> <p>(c) Measures provide for transferring markings to assure traceability is maintained.</p> <ol style="list-style-type: none"> <li>(1) If a coded marking system is used, it is documented and acceptable to the Authorized Inspector.</li> </ol> <p>(d) Measures assure that the Authorized Inspector is informed of approaching inspection points.</p> <p>(e) [Not applicable to H (Cast Iron and Cast Aluminum), T Class 3, V, HV, UD, UV, UV3, TD and TV] AI concurrence is obtained for repairs to material.</p> <p>(f) [Not applicable to H (Cast Iron and Cast Aluminum), T Class 3, V, HV, UD, UV, UV3, TD and TV] Measures are established to assure that a final inspection is performed to assure all specified requirements have been met prior to obtaining AI's concurrence for application of the Certification Mark.</p> <p>(g) [Not applicable to V, HV, UD, UV, UV3, TD and TV] Measures are established to provide for the preparation, certification, and distribution of the applicable Data Reports.</p> <p>(h) Measures are established to control field activities, when applicable.</p>	

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	<p>(i) [For operations under UG-90(c)(2), HG-515.4(b), or TS200.7] Documented procedures exist and are accepted by the Authorized Inspection Agency (AIA), Jurisdictional Authority, and ASME Designee.</p> <p>Note: Procedures should fully describe AI coverage of ASME Code work on all shifts. Also, percentage of AI time spent inspecting vessels or boilers that may not qualify for handling under UG-90(c)(2), HG-515.4(b), or TS200.7 should be addressed.</p> <p>(j) [Applicable to H (Cast Iron and Cast Aluminum) only] Examination and inspection of each boiler or boiler part shall be in compliance with Article 2 of Part HC and/or HA (as applicable).</p> <p>(k) [Applicable to H (Cast Iron and Cast Aluminum) and UIG (Graphite)]</p> <p>(1) For H (Cast Iron and Cast Aluminum) hydrostatic tests are conducted as required in HC-410 and/or HA – 406 (as applicable) and there are means of identifying acceptable boiler sections or parts; and</p> <p>(2) For U (Graphite) pressure vessels hydrostatic tests are conducted as required in UIG-99 and there are means of identifying acceptable graphite pressure vessel parts.</p> <p>(l) [Applicable to RP and UIG]</p> <p>(1) Resin or cement mixing procedures are specified; and</p> <p>(2) Measures are established covering storage, issuance, handling, and disposal or resins, catalysts, fillers, pigments or cements.</p> <p>(m) [Applicable to RP and UIG]</p> <p>(1) Procedures exist covering:</p> <p style="padding-left: 40px;">(i) assembly and fit-up of the pressure vessel and parts; and</p> <p style="padding-left: 40px;">(ii) adhesive-bonding of components.</p> <p>(n) [Applicable to V, HV, UD, UV, UV3, TD and TV only] Provisions exist for testing pressure relief devices as described in PG-73.4, HG-401.4 and UG-136(d), UG-137(d), KR-340, TR210.4 and TR310.5.</p> <p>(o) [Applicable to E, H (Cast Iron and Cast Aluminum), UM, V, HV, UD, UV, UV3, TD and TV only]</p> <p>(p) Certified Individual (C.I)</p>	



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	<ul style="list-style-type: none"> <li>i. Is an employee of the Applicant</li> <li>ii. meets knowledge and training requirements and is qualified and certified by the Manufacturer; and</li> <li>iii. records are available, maintained, certified by the Manufacturer and contain objective evidence of the Certified Individual's qualification.</li> </ul> <p>Measures are established to assure that the Certified Individual performs all required duties specified in the applicable Code.</p>	
7.	<p><b><u>CORRECTION OF NONCONFORMITIES</u></b></p> <p>(a) A procedure exists for the correction of nonconformities. Where AI involvement is required by the Code, the procedure is agreed upon with the AI. The procedure provides for:</p> <ul style="list-style-type: none"> <li>(1) identifying those responsible for the resolution of nonconformities;</li> <li>(2) identifying and controlling further processing of nonconforming items until final disposition;</li> <li>(3) documenting the nonconformance and its disposition; and</li> <li>(4) [Not applicable to H (Cast Iron and Cast Aluminum), T Class 3, V, HV, UD, UV, UV3, TD and TV] informing the AI of nonconforming conditions.</li> </ul> <p>Note: A nonconformity is any condition which does not comply with the applicable rules of the Code, QC Manual or other specified requirements. Nonconformities must be corrected before the completed component can be considered to comply with the Code.</p>	
8.	<p><b><u>WELDING/CEMENTING</u></b></p> <p>(UIG) [Not applicable to H (Cast Iron and Cast Aluminum) or RP]</p> <ul style="list-style-type: none"> <li>(a) Welding/cementing conforms to requirements of Section VIII Div. 1, Section IX and other Sections of the Code, as applicable to the scope of work.</li> <li>(b) Those responsible for certifying PQR's/CCQ's, CPQ's and WPQ's/CTQ's are identified.</li> <li>(c) WPS's/CPS's are available to the welder/cementing technician in the work area.</li> </ul>	

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Item No.	Quality Element and Sub-elements	QC Manual References
	<p>(d) Measures assure continued welder/cementing technician qualification in accordance with Section VIII Div. 1 (UIG-80(d) or Section IX.</p> <p>(e) Those responsible for assuring that only qualified welders/cementing technicians are assigned to perform Code welding or cementing are identified.</p> <p>(f) Measures provide for the storage and conditioning, as required, of covered electrodes and conditioning of cements and their ingredients.</p> <p>(g) Measures are established for the control, issuance and return of welding material or disposal of cementing material to assure proper materials are used.</p> <p>(h) Measures are established for removing or inspecting tack welds.</p> <p>(i) Measures provide for the, right at any time, of the AI [or ASME Designated Organization for V, HV, UD, UV, UV3, TD and TV] to call for and witness tests of the welding/brazing/cementing procedures; call for and witness of the ability of welders, welding operators, brazers or brazing operators, or cementing technicians.</p> <p>(j) Measures provide for a system to identify work completed by each welder/cementing technician.</p>	
9.	<p><b><u>NONDESTRUCTIVE EXAMINATION</u></b></p> <p>[Not applicable to H (Cast Iron and Cast Aluminum) or RP]</p> <p>(a) Provisions exist for identifying the appropriate NDE procedures applicable to the scope of Code work. These provisions assure that:</p> <p style="padding-left: 40px;">(1) NDE personnel are qualified in accordance with the applicable Code Section requirement;</p> <p style="padding-left: 40px;">(2) NDE [(UT, MT, PT and VT (UIG))] examinations are performed in accordance with written procedures when required;</p> <p style="padding-left: 40px;">(3) The AIA [or representative from an ASME Designated Organization for V, HV, UD, UV, UV3, TD and TV] can require demonstration by NDE personnel of an NDE examination or NDE procedures for cause;</p> <p style="padding-left: 40px;">(4) UT reports and RT films, as applicable, are retained in accordance with the applicable Code requirement; and</p> <p style="padding-left: 40px;">(5) NDE equipment is calibrated.</p>	

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10.	<p><b><u>HEAT TREATMENT</u></b></p> <p>[Not applicable to H (Cast Iron and Cast Aluminum), RP or UIG]</p> <p>(a) Controls provided to assure that heat treatment as required by the Code for the scope of Code work is applied.</p> <p>(b) Measures are established to assure proper placement of thermocouples and use of charts.</p> <p>(c) When heat treatment is subcontracted, measures are established to assure that procedures are followed and that heat treatment charts are provided.</p> <p>(d) Means are provided for the AI [or a representative from an ASME Designated Organization for V, HV, UD, UV, UV3, TD and TV] to satisfy them that Code heat treatment requirements are met, (e.g., review of furnace time-temperature records or other methods as appropriate).</p>	
11.	<p><b><u>CALIBRATION OF MEASUREMENT AND TEST EQUIPMENT</u></b></p> <p>(a) A procedure exists for the calibration of examination, measuring and test equipment used in fulfillment of applicable Code requirements.</p> <p>(b) Measures are established that assure calibration records are maintained and that status indicators are used to indicate the current calibration status of equipment.</p>	
12.	<p><b><u>RECORDS RETENTION</u></b></p> <p>(a) Procedures exist for the maintenance of Manufacturer's Data Reports, radiographs and records as required by the applicable Section of the Code.</p>	
13.	<p><b><u>SAMPLE FORMS</u></b></p> <p>(a) Forms used to control functions relative to quality are included within the QC Manual and their use explained in the text of the QC Manual.</p>	
14.	<p><b><u>AUTHORIZED INSPECTOR (AI)</u></b></p> <p>[Not applicable to H (Cast Iron and Cast Aluminum), T Class 3, V, HV, UD, UV, UV3, TD and TV]</p> <p>(a) An inspection agreement is established and maintained with an ASME accredited Authorized Inspection Agency. For Section XII Class 2 this could be a qualified inspection organization. (QIO).</p>	

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	<p>All required inspections are to be performed by the AIA of Record (the AIA identified on the application). Alternatively, When the purchaser requests another AIA (Secondary AIA) to perform inspection on its projects or Code jobs or whenever the AIA of Record cannot provide coverage for inspections at a specific field site the following shall be included in the QC Manual:</p> <ol style="list-style-type: none"> <li>(1) Description of how different AIA's will perform activities under their Certificate(s) of Authorization;</li> <li>(2) Ensure the Certificate Holder has a contract or agreement with the AIA performing the shop/field activities; and</li> <li>(3) Show evidence that this program has been accepted by the AIA of Record.</li> </ol> <p>Note: The provisions for the use of an AIA other than the AIA of Record is not intended for use by a shop working with Mass Production of pressure vessels.</p> <ol style="list-style-type: none"> <li>(b) A controlled copy of the QC Manual is available to the AI at the plant or construction site where Code activities are being carried out.</li> <li>(c) The AI has access to all drawings, calculations, specifications, procedures, process sheets, repair procedures, records, test results, and any other documents as necessary for the AI to perform their duties.</li> <li>(d) Provisions exist for providing a liaison between the AI and the Manufacturer/Installer.</li> <li>(e) Provisions exist for free access for the AI and the Inspection Supervisor to all areas involving Code activities.</li> <li>(f) Provisions exist to assure that all Code required inspections by the AI are performed.</li> <li>(g) ASME is notified whenever the agreement is cancelled or changed to another accredited Authorized Inspection Agency</li> <li>(h) Provisions exist for AIA's periodic inspection of the E Stamp Holder Code activities per PEB 18.2.2</li> <li>(i) Provisions exist for the reviews for UM certification renewal after the first and second years of each 3 year review cycle to be performed by the Authorized Inspection Supervisor and report submitted to ASME.</li> </ol>	

## QUALITY SYSTEM REVIEW CHECKLIST

Item No.	Quality Element and Sub-elements	QC Manual References
15.	<p><b><u>ASME DESIGNEE AND ASME DESIGNATED ORGANIZATION</u></b></p> <p>[Applicable to H (Cast Iron and Cast Aluminum), V, HV, UD, UV, UV3 , TD and TV only]</p> <p>(a) A controlled copy of the QC Manual is available to the ASME Designee or ASME Designated Organization, as applicable.</p> <p>(b) The ASME Designee or representative from an ASME Designated Organization has access to all drawings, calculations, specifications, procedures, process sheets, repair procedures, records, test results, and any other documents as necessary for the ASME Designee to perform the review in accordance with the Code.</p> <p>(c) [Applicable to V, HV, UD, UV, UV3, TD and TV only] Provisions exist for the inspection of pressure relief valves as described in PG-73.4, HG-401.3, UG-136(c), UG-137(c) KR-330, TR210.3, and TR310.4.</p>	
16.	<p><b><u>CERTIFICATIONS</u></b></p> <p>(a) Provisions exists for written certifications, authorizations and approval that require written signature and written date.</p> <p>(b) Provisions exists for certification methods other than written, when used, describing the controls and safe guards that are employed to ensure the integrity of the certification, authorization or approval.</p>	