

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
<b>B31.1-2018 Required Minimum Documentation</b>						
1	127 Welding	127.6 Welding Records	The employer shall maintain a record (WPS and/or WPQ) signed by him/her, and available to the purchaser or his/her agent and the inspector, of the WPSs used and the welders and/or welding operators employed by him/ her, showing the date and results of procedure and performance qualification. The WPQ shall also show the identification symbol assigned to the welder or welding operator employed by him/her, and the employer shall use this symbol to identify the welding performed by the welder or welding operator. This may be accomplished by the application of the symbol on the weld joint in a manner specified by the employer. Alternatively, the employer shall maintain records that identify the weld(s) made by the welder or welding operator.	Records of WPS and WPQ. Record of welder or weld operator symbol or records of each weld shall be retained denoting the location and welder(s) so if welds must be removed they may be located	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
2	128 Brazing and Soldering	128.6 Brazing Records	The employer shall maintain a record signed by him/ her and available to the purchaser or his/her agent and the inspector, showing the date and results of procedure and performance qualification. The BPQ shall also show the identification symbol assigned to the brazer or brazing operator employed by him/her, and the employer shall use this symbol to identify the brazing performed by the brazer or brazing operator. This may be accomplished by the application of the symbol on the braze joint in a manner specified by the employer. Alternatively, the employer shall maintain records that identify the braze joint(s) made by the brazer or brazing operator.	Records of BPS and BPQ. Record of welder or weld operator symbol or records of each weld shall be retained denoting the location and welder(s) so if welds must be removed they may be located	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
3	141 CPS Records	141.1 General	Covered piping system records shall consist of, but not be limited to, (a) any procedures required by para. 139 (b) any condition assessment documentation required by para. 140 (c) original, as-built, as modified, or updated piping drawings (d) original, as-built, as modified, or updated pipe support drawings (e) results from piping stress or flexibility analysis (f) piping system diagrams [flow, piping and instrumentation (P&IDs), and/or process diagrams]	c) original, as-built, as modified, or updated piping drawings (d) original, as-built, as modified, or updated pipe support drawings (e) results from piping stress or flexibility analysis (f) piping system diagrams [flow, piping and instrumentation (P&IDs), and/or process diagrams]	LANL	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

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			<p>(g) valve and other inline equipment data used in original piping design stress analysis                      (h) additional documentation requirements as identified in <a href="#">paras. 141.2, 141.3, 141.4, and 141.5</a></p>	<p>(g) valve and other inline equipment data used in original piping design stress analysis</p>		
4	139 Operation and Maintenance Procedures	(referenced from 141.1 General)	<p>For <i>(Covered Piping System -ed)</i> CPS, this shall be accomplished by the issuance of written operation and maintenance procedures. The operation and maintenance procedures established by the Operating Company for ensuring safe operation of its CPS may vary, but the following aspects shall be covered:                      (a) operation of piping system within design limits                      (b) documentation of system operating hours and modes of operation                      (c) documentation of actual operating temperatures and pressures                      (d) documentation of significant system transients or excursions including thermal hydraulic events (e.g., steam hammers, liquid slugging)                      (e) documentation of modifications, repairs, and replacements, including welding procedures used and NDE results                      (f) documentation of maintenance of pipe supports for piping operating within the creep regime                      (g) documentation of maintenance of piping system elements such as vents, drains, relief valves, desuperheaters, and instrumentation necessary for safe operation</p>	<p>(a) operation of piping system within design limits                      (b) documentation of system operating hours and modes of operation                      (c) documentation of actual operating temperatures and pressures                      (d) documentation of significant system transients or excursions including thermal hydraulic events (e.g., steam hammers, liquid slugging)                      (e) documentation of modifications, repairs, and replacements, including welding procedures used and NDE results                      (f) documentation of maintenance of pipe supports for piping operating within the creep regime                      (g) documentation of maintenance of piping system elements such as vents, drains, relief valves, desuperheaters, and instrumentation necessary for safe operation</p>	LANL	
5	140 Condition Assessment of CPS	(referenced from 141.1 General)	<p>A program shall be established to provide for the assessment and documentation of the condition of all CPS. The documentation shall include a statement as to any actions necessary for continued safe operation. A condition assessment shall be performed at periodic intervals as determined by an engineering evaluation. Condition assessments shall be made of CPS based on</p>	<p>The condition assessment documentation, in a form established by the Operating Company, should contain (but not be limited to) as many of the following elements as available:</p>	LANL or the Operating Company if different than LANL	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			<p>established industry practices. The condition assessment may range from a review of previous inspection findings and operating history since the previous inspection, to a thorough nondestructive examination (NDE) and engineering evaluation. The extent of the assessment performed shall be established by the Operating Company or its designee with consideration of the age of the CPS, the previous documented assessment, and anticipated operating conditions. The CPS condition assessment program shall include implementation of weld examination and hanger inspection methods necessary for evaluating the impact of the applicable material degradation mechanism for the identified piping system. The condition assessment documentation, in a form established by the <b>Operating Company</b>, should contain (but not be limited to) as many of the following elements as available:</p> <p>(a) system name.                      (b) listing of original material specifications and their editions.                      (c) design diameters and wall thicknesses.                      (d) design temperature and pressure.                      (e) normal operating temperature and pressure.                      (f) operating hours, both cumulative (from initial operation) and since last condition assessment.                      (g) actual modes of operation since last condition assessment (such as the number of hot, warm, and cold starts).                      (h) pipe support hot and cold walkdown readings and conditions since last condition assessment for piping systems that are operated within the creep regime.                      (i) modifications and repairs since last condition assessment.                      (j) description and list of any dynamic events, including thermal hydraulic events, since the last condition assessment (see <a href="#">Nonmandatory Appendix V, para. V-11</a> for examples) that produced visual evidence of distortion or damage. Repetitive dynamic events (with or without visual evidence) should be included when identified by operators or plant personnel (see <a href="#">para. 146</a>).</p>	<p>(a) system name.                      (b) listing of original material specifications and their editions.                      (c) design diameters and wall thicknesses.                      (d) design temperature and pressure.                      (e) normal operating temperature and pressure.                      (f) operating hours, both cumulative (from initial operation) and since last condition assessment.                      (g) actual modes of operation since last condition assessment (such as the number of hot, warm, and cold starts).                      (h) pipe support hot and cold walkdown readings and conditions since last condition assessment for piping systems that are operated within the creep regime.                      (i) modifications and repairs since last condition assessment.                      (j) description and list of any dynamic events, including thermal hydraulic events, since the last condition assessment (see <a href="#">Nonmandatory Appendix V, para. V-11</a> for examples) that produced visual evidence of distortion or damage. Repetitive dynamic events (with or without visual evidence) should be</p>		

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

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			<p>(k) actual pipe wall thickness and outside diameter measurements taken since the last condition assessment as appropriate based on service.</p> <p>(l) summary of pipe system inspection findings, including list of areas of concern.</p> <p>(m) recommendations for reinspection interval and scope. Guidance on condition assessment may be found in <a href="#">Nonmandatory Appendix V</a> of this Code.</p>	<p>included when identified by operators or plant personnel (see <a href="#">para. 146</a>).</p> <p>(k) actual pipe wall thickness and outside diameter measurements taken since the last condition assessment as appropriate based on service.</p> <p>(l) summary of pipe system inspection findings, including list of areas of concern.</p> <p>(m) recommendations for reinspection interval and scope. Guidance on condition assessment may be found in <a href="#">Nonmandatory Appendix V</a> of this Code.</p>		
6	141 CPS Records	141.2 Materials	<p>The owner shall establish a material history for each covered piping system to the extent necessary to permit evaluation and analysis of an existing condition. <b>The records listed below are to be included in the material history and be traceable to specific components in a piping system.</b> Additional records may be included as deemed necessary.</p> <p>(a) procurement documents, including specifications</p> <p>(b) original service date and original operating parameters</p> <p>(c) list of materials, both original and replacement, with system location and material specification</p> <p>(d) physical and mechanical properties from material test reports, including the following as applicable:</p> <ul style="list-style-type: none"> <li>(1) Manufacturer’s Material Test Reports or Certificate of Conformance</li> <li>(2) chemical composition data</li> <li>(3) impact test data</li> <li>(4) information regarding special processing, i.e., welding, postweld heat treatment, mechanical working, bending including post-bending heat treatment, etc.</li> </ul>	<p>procurement documents, including specifications</p> <p>(b) original service date and original operating parameters</p> <p>(c) list of materials, both original and replacement, with system location and material specification</p> <p>(d) physical and mechanical properties from material test reports, including the following as applicable:</p> <ul style="list-style-type: none"> <li>(1) Manufacturer’s Material Test Reports or Certificate of Conformance</li> <li>(2) chemical composition data</li> <li>(3) impact test data</li> </ul>	LANL	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			<p>(e) wall thicknesses from construction or maintenance records, including design minimum wall requirements                      (f) records of alterations or repairs                      (g) summary of design requirements                      (h) actual operating conditions recorded and maintained to facilitate creep and fatigue evaluations of components                      (i) special coatings, linings, or other designs for corrosion or erosion resistance</p>	<p>(4) information regarding special processing, i.e., welding, postweld heat treatment, mechanical working, bending including post-bending heat treatment, etc.                      (e) wall thicknesses from construction or maintenance records, including design minimum wall requirements                      (f) records of alterations or repairs                      (g) summary of design requirements                      (h) actual operating conditions recorded and maintained to facilitate creep and fatigue evaluations of components                      (i) special coatings, linings, or other designs for corrosion or erosion resistance</p>		
7	141 CPS Records	141.3 Installation, Modification, and Repair	<p><b>Records for pressure-retaining welds in covered piping systems shall include</b>, but not be limited to, the following:                      (a) original installation records                      (b) repair and modification records                      (c) welding procedures and qualification tests                      (d) nondestructive examination reports (including radiographs, digital or electronically stored NDE reports, etc.)                      (e) heat treatment performed, including time/temperature charts</p>	<p>(a) original installation records                      (b) repair and modification records                      (c) welding procedures and qualification tests                      (d) nondestructive examination reports (including radiographs, digital or electronically stored NDE reports, etc.)                      (e) heat treatment performed, including time/temperature charts</p>	LANL	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
8	141 CPS Records	141.4 Failure Analysis	The owner is responsible for investigating all failures in covered piping systems. A report of the results of this investigation is to be included in the material history file and, as a minimum, contain the following information: (a) record of any operating or test experience of the failed components or supports (b) any previous failure history of the component (c) any special conditions (corrosion, extraordinary loads, thermal excursions, etc.) that may have contributed to failure (d) conclusions of damage mechanism(s) and cause of failure	(a) record of any operating or test experience of the failed components or supports (b) any previous failure history of the component (c) any special conditions (corrosion, extraordinary loads, thermal excursions, etc.) that may have contributed to failure (d) conclusions of damage mechanism(s) and cause of failure	LANL	
9	141 CPS Records	141.5 Restoration After Failure	The owner is responsible for documenting actions taken to restore failed components, including (a) recommendations for actions that are intended to minimize recurrence and documentation of satisfactory implementation (b) recommendations, if any, for similar action that should be taken in other piping systems containing similar conditions or components	(a) recommendations for actions that are intended to minimize recurrence and documentation of satisfactory implementation (b) recommendations, if any, for similar action that should be taken in other piping systems containing similar conditions or components	LANL	
10	144 CPS WALKDOWNS		The Operating Company shall develop and implement a program requiring documentation of piping support readings and recorded piping system displacements.	documentation of piping support readings and recorded piping system displacements.	LANL or the Operating Company if different than LANL	
11	N-127 BONDING PLASTIC JOINTS	N-127.6 Qualification Records	An erector using bonders or bonding operators shall maintain a record of the procedures used and of operators employed by him/her who are qualified in these procedures.	erector using bonders or bonding operators shall maintain a record of the procedures used and of operators employed by him/her who are qualified in these procedures	LANL if self-performed, subcontractor if performed by others.	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

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<b>B31.1-2018 Owner Approval</b>						
12	Introduction		For design and construction, a designer may choose to use a more-rigorous analysis to develop design and construction requirements. When the designer decides to take this approach, the designer shall provide to the owner details and calculations demonstrating that design, construction, examination, and testing are consistent with the criteria of the Code. These details shall be adequate for the owner to verify the validity of the approach and shall be <b>approved by the owner</b> . The details shall be documented in the engineering design.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
13	100.1 Scope	100.1.3	(f) piping included as part of a shop-assembled packaged equipment assembly within a B31.1 Code piping installation when such equipment piping is constructed to another B31 Code Section (e.g., B31.3 or B31.9) with the <b>owner's approval</b> . See para. 100.2 for a definition of packaged equipment.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
14	100.2 Definitions		readily accessible: for visual examination, readily accessible inside surfaces are defined as those inside surfaces that can be examined without the aid of optical devices. (This definition does not prohibit the use of optical devices for a visual examination; however, the <b>selection of the device should be a matter of mutual agreement between the owner</b> and the fabricator or erector.)	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
15	104 PRESSURE DESIGN OF COMPONENTS	104.7.2 Specially Designed Components	Calculations and documentation showing compliance with this paragraph shall be available for the <b>owner's approval</b> and, for boiler external piping, they shall be available for the Authorized Inspector's review.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
16	122 DESIGN REQUIREMENTS PERTAINING TO SPECIFIC PIPING SYSTEMS	122.8.1 Flammable Gas	Each flammable gas vent point shall be subjected to a hazard analysis that requires <b>owner approval</b> .	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

17	123.1 Materials and Specifications	123.1.2 Unlisted Materials	(d) The designer shall document the <b>owner's acceptance</b> for use of unlisted material.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
18	127 Welding	127.5.3 Qualification Responsibility	However, to avoid duplication of effort, and subject to <b>approval of the owner</b> , a WPS qualified by a technically competent group or agency may be used... However, to avoid duplication of effort, he/she may accept a Welder/Welding Operator Performance Qualification (WPQ) made by a previous employer (subject to the approval of the owner or his/her agent) on piping using the same or an equivalent procedure wherein the essential variables are within the limits established in ASME BPVC, Section IX.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
19	128 BRAZING AND SOLDERING	128.5.3 Qualification Responsibility	subject to <b>approval of the owner</b> , a BPS qualified by a technically competent group or agency may be used... However, to avoid duplication of effort, he/she may accept a Brazer/Brazing Operator Performance Qualification (BPQ) made by a previous employer (subject to the approval of the owner or his/her agent) on piping using the same or an equivalent procedure wherein the essential variables are within the limits established in ASME BPVC, Section IX.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
20	136 INSPECTION AND EXAMINATION	136.1.4 Qualifications of the Owner's Inspector	(c) In delegating the performance of inspections, <b>the owner is responsible for determining that a person to whom an inspection function is delegated is qualified to perform that function.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
21	136 INSPECTION AND EXAMINATION	136.3 Examination 136.3.1 General.	Examination denotes the functions performed by the manufacturer, fabricator, erector, or a party authorized by the owner that include nondestructive examinations (NDE), such as visual, radiography, ultrasonic, eddy current, liquid penetrant, and magnetic particle methods. The degree of examination and the <b>acceptance standards beyond the requirements of this Code shall be a matter of prior agreement between the manufacturer, fabricator, or erector and the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
22	136 INSPECTION AND EXAMINATION	136.4.6 Ultrasonic Examination	Where physical obstructions prevent the use of systems capable of recording the UT data, manual UT may be used with the <b>approval of the owner</b> . Personnel, procedures, and equipment used to collect and analyze UT data shall have	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	



**ADMIN 1-B31.1-DOCS Minimum System Documentation**

			demonstrated their ability to perform an acceptable examination using test blocks approved by the owner.			
23	137 PRESSURE TESTS	137.1.2 Temperature of Test Medium	The temperature of the test medium shall be that of the available source <b>unless otherwise specified by the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
24	137 PRESSURE TESTS	137.2.4 Isolation of Equipment and Piping Not Subjected to Pressure Test.	The <b>owner shall be aware</b> of the limitations of pressure and temperature for each valve subject to test conditions and as further described in para. 107.1(c).	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
25	137 PRESSURE TESTS	137.3.2 Nonboiler External Piping	All nonboiler external piping shall be hydrostatically tested in accordance with para. 137.4. As an alternative, <b>when specified by the owner</b> , the piping may be leak tested in accordance with para. 137.5, 137.6, or 137.7.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
26	137 PRESSURE TESTS	137.4.3 Test Medium	Water shall normally be used as the test medium <b>unless otherwise specified by the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
27	137 PRESSURE TESTS	137.5 Pneumatic Testing 137.5.1 General.	Except for preliminary testing in accordance with para. 137.5.4, pneumatic testing shall not be used <b>unless the owner specifies pneumatic testing or permits its use as an alternative.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
28	137 PRESSURE TESTS	137.6 Mass-Spectrometer and Halide Testing 137.6.1	<b>When specified by the owner</b> , systems with conditions of operation and design that require testing methods having a greater degree of sensitivity than can be obtained by a hydrostatic or pneumatic test shall be tested by a method, such as helium mass-spectrometer test or halide test, which has the required sensitivity.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
29	137 PRESSURE TESTS	137.7 Initial Service Testing 137.7.1	<b>When specified by the owner</b> , an initial service test and examination is acceptable when other types of tests are not practical or when leak tightness is demonstrable due to the nature of the service.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
30	138 GENERAL		<b>At the owner's discretion</b> , other piping systems may be included.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

31	N-124 LIMITATIONS ON MATERIALS	N-124.9.2 Thermoplastics	(a) Thermoplastics shall not be used in flammable fluid service aboveground, unless all of the following are met: (1) The size of the piping does not exceed DN 25 (NPS 1). (2) <b>Owner's approval is obtained.</b> N-127.5.3 Qualification by Others (a) BPS. Each employer (e.g., piping fabricator or erector) shall be responsible for qualifying any BPS that personnel of his/her organization will use. Subject to the specific approval of the owner, a BPS qualified by others may be used if the following conditions apply:	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
32	N-127 BONDING PLASTIC JOINTS	N-127.5.3 Qualification by Others	(b) Bonding Performance Qualification. An employer shall not accept a performance qualification test made by a bonder or bonding operator for another employer <b>without the owner's specific approval.</b> If approval is given, acceptance is limited to performance qualification tests on piping using the same or an equivalent BPS	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
33	N-136.3 Examination	N-136.3.1 General.	The degree of examination and the acceptance standards beyond the requirements of this Code shall be a matter of prior agreement between the manufacturer, fabricator, or erector and <b>the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
34	P-3.1 Expansion Joint Design	P-3.1.2 Design Stress Limits.	For convoluted-type bellows, stresses shall be calculated either by the formulas shown in the EJMA Standards <b>or by other methods acceptable to the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
35	P-3.1 Expansion Joint Design	P-3.1.3 Fatigue Analysis	(e) An alternative fatigue correction factor, $f_c$ , may be used <b>with the permission of the owner.</b>	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

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<b>B31.1-2018 Qualifications</b>						
36	100 General	100.1.2 Boiler External Piping	...however, the holder of a valid ASME Certification Mark, Certificate of Authorization, with an "S," "A," or "PP" Designator shall be responsible for the documentation and hydrostatic test, regardless of the method of assembly. The quality control system requirements of ASME BPVC, Section I; ASME CA-1; and ASME QAI-1, Qualifications for Authorized Inspectors shall apply. made by the brazer or brazing operator.			
37	100 General	100.2 Definitions	qualified (personnel): individuals who have demonstrated and documented abilities gained through training and/or experience that enable them to perform a required function to the satisfaction of the Operating Company.			
38	136 Inspection and Examination 136.1 Inspection	136.1.4 Qualifications of the Owner's Inspector	(a) The Owner's Inspector shall be designated to perform inspections on behalf of the owner and shall be an employee of the owner, an engineering or scientific organization, or a recognized insurance or inspection company acting as the owner's agent. The Owner's Inspector shall not represent nor be an employee of the piping manufacturer, fabricator, or erector unless the owner is also the manufacturer, fabricator, or erector. (b) The Owner's Inspector shall meet one of the following requirements: (1) have at least 10 yr of experience in the design, manufacture, erection, fabrication, inspection, or examination of piping systems. Each year of satisfactorily completed work toward an accredited engineering or engineering technology degree shall be considered equivalent to 1 yr of experience, up to 5 yr total. (2) have a professional engineering registration or nationally recognized equivalent with a minimum of 5 yr of experience in the design, manufacturing, erection, fabrication, inspection, or examination of piping systems. (3) be a certified Welding Inspector or a Senior Certified Welding Inspector as defined in AWS QC1, or a nationally recognized equivalent, with a minimum of 5 yr of experience in the design, manufacturing, erection, fabrication, inspection, or examination of piping systems. (4) be an Authorized Piping Inspector as defined in API 570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems, with a minimum of 5 yr of experience in the design, manufacturing, erection, fabrication, inspection, or examination of piping systems. (c) In delegating the performance of inspections, the owner is responsible for determining that a person to whom an inspection function is delegated is qualified to perform that function.			
39	136.2 Inspection	136.2.1	Piping for which Authorized Inspection and stamping is required as determined in accordance with para. 100.1.2(a) shall be inspected during construction and after			

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
	and Qualification of Authorized Inspector for Boiler External Piping		completion and at the option of the Authorized Inspector at such stages of the work as he/ she may designate. For specific requirements see the applicable parts of ASME BPVC, Section I, PG-104 through PG-113. Each manufacturer, fabricator, or assembler is required to arrange for the services of Authorized Inspectors			
40	136.2 Inspection and Qualification of Authorized Inspector for Boiler External Piping	136.2.1.1	The Authorized Inspection required by this Code Section shall be performed by an Inspector employed by an ASME accredited Authorized Inspection Agency.			
41	136.3 Examination	136.3.2 Qualification of NDE Personnel.	Personnel who perform nondestructive examination of welds shall be qualified and certified for each examination method in accordance with a program established by the employer of the personnel being certified, which shall be based on the following minimum requirements: (a) instruction in the fundamentals of the nondestructive examination method. (b) on-the-job training to familiarize the NDE personnel with the appearance and interpretation of indications of weld defects. The length of time for such training shall be sufficient to ensure adequate assimilation of the knowledge required. (c) an eye examination performed at least once each year to determine optical capability of NDE personnel to perform the required examinations. (d) upon completion of (a) and (b), the NDE personnel shall be given a written examination and performance examination by the employer to determine if the NDE personnel are qualified to perform the required examinations and interpretation of results. (e) certified NDE personnel whose work has not included performance of a specific examination method for a period of 1 yr or more shall be recertified by successfully completing the examination of (d) and also passing the visual examination of (c). Substantial changes in procedures or equipment shall require recertification of the NDE personnel. As an alternative to the preceding program, the requirements of ASME BPVC, Section V, Article 1, T-120(e) or T- 120(f) may be used for the qualification of NDE personnel. Personnel qualified to AWS QC1 may be used for the visual examination of welds provided they meet the annual			

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			eye examination requirement of (c) and the J1 visual acuity requirement of ASME BPVC, Section V, Article 9.			
42	142 Piping and Pipe-Support Maintenance Program and Personnel Requirements	142.2 Personnel	142.2.1 Only qualified personnel shall be responsible for executing the maintenance program of the Operating Company. For further guidelines regarding typical maintenance program responsibilities, see Nonmandatory Appendix V, para. V-5.2. 142.2.2 Review of records and failure reports, and decisions concerning corrective actions or repairs, shall be carried out by or under the direction of qualified personnel. 142.2.3 Welding and Heat Treatment Personnel (a) Welders shall be qualified to approved welding procedures. Qualification of weld procedures and the qualification performance of the welder shall be in accordance with the requirements of para. 127.5.(b) Qualified personnel shall perform preheat and postheat treatment operations as described in the requirements of paras. 131 and 132. 142.2.4 Examination, Inspection, and Testing Personnel. Qualified personnel shall perform nondestructive examinations (NDE), including visual inspections and leak tests (LT), in accordance with the requirements of para. 136.			
43	N-135 Assembly and Erection	N-135.3.5 Flaring of Nonmetallic Linings	(3) Flaring shall be performed only in accordance with a written flaring procedure specification, and only by qualified operators who have appropriate training or experience in the use of the applicable flaring procedures.			
44	N-136.3 Examination	N-136.3.2 Qualification of NDE Personnel.	Personnel who perform nondestructive examination of bonds shall be qualified and certified for each examination method in accordance with a program established by their employer. The program shall be based on the following minimum requirements: (a) instruction in the fundamentals of the nondestructive examination method. (b) on-the-job training to familiarize the NDE personnel with the appearance and interpretation of indications of bond defects. The length of time for such training shall be sufficient to ensure adequate assimilation of the knowledge required. (c) an eye examination, performed at least once each year, to determine optical capability of NDE personnel to perform the required examination. (d) upon completion of (a) and (b), the NDE personnel shall be given an oral or written examination and performance examination by the employer, to determine if the NDE personnel are qualified to perform the required examination and interpretation of results. (e) certified NDE personnel whose work has not included performance of a specific examination method for a period of 1 yr or more shall be recertified by successfully successfully completing			

**ADMIN 1-B31.1-DOCS Minimum System Documentation**

<b>No.</b>	<b>B31.1 Code Heading</b>	<b>B31.1 Code Reference</b>	<b>Code Text</b>	<b>How</b>	<b>Who</b>	<b>Applic. to System? (Y/N)</b>
			the examination of (d) and also passing the visual examination of (c). Substantial changes in procedures or equipment shall require recertification of NDE personnel.			