

ADMIN 1-B31.3-DOCS Minimum System Documentation

No.	B31.3 ¹ Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.1-Required Minimum System Documentation						
Metallic Piping						
1	323.3 Impact Testing Methods and Acceptance Criteria	Table T323.3.1	Impact Testing, records of tests	A certified report of impact tests performed (after being appropriately heat treated as required by Table 323.2.2, item B-3) by the manufacturer shall be obtained as evidence that the material (including any welds used in its manufacture) meets the requirements of this Code	Subcontractor or LANL if self-performed	
2	328.2 Welding and Brazing Qualification	328.2.4 Qualification Records	The employer shall maintain copies of the procedure and performance qualification records specified by Section IX that shall be available to the Inspector at the location where welding is being done.	Records of WPS and Welding PQR available where the work is being done	LANL for self-performed and for work done at LANL; Subcontractor for work done on or offsite	
3	328.5 Welding Requirements	328.5.1 (b)	In lieu of marking the weld appropriate records shall be filed	Records of each weld shall be retained denoting the location and welder(s) so if welds must be removed they may be located	Subcontractor or LANL if self-performed	
4	333 BRAZING AND SOLDERING	333.1 Qualification 333.1.1 Brazing Qualification	The qualification of brazing procedures, brazers, and brazing operators shall be in accordance with para. 328.2. For Category D Fluid Service at design temperature not over 93°C (200°F), such qualification is not required unless specified in the engineering design.	Records of BPS, PQR, and BPQ available where the work is being done.	LANL for self-performed for work done at LANL; Subcontractor for work done on or offsite	
5	333 BRAZING AND SOLDERING	333.1.2 Soldering Qualification	The qualification of solderers shall be in accordance with the requirements of ASTM B828, Standard Practice for Making Capillary Joints by Soldering of	Not part of ESM Chapter 13	Not part of ESM Chapter 13	

¹ Based on B31.3-2016

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			Copper and Copper Alloy Tube and Fittings.			
6	335 Assembly and Erection	335.2.5 Flanged Joint Assembly	Assembly requirements for bolted flanged joints and flanged joint assembler qualifications shall be considered in the engineering design.	Documentation of flanged joint assembly qualifications in design	Subcontractor or LANL if self-performed	
7	340 Inspection	340.4 Qualifications of the Owner's Inspector	a) The owner's Inspector shall be designated by the owner and shall be the owner, an employee of the owner, an employee of an engineering or scientific organization, or of 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 years of experience in the design, fabrication, or examination of industrial pressure piping. Each 20% of satisfactorily completed work toward an accredited engineering degree shall be considered equivalent to 1 year of experience, up to 5 years total. (2) have a professional engineering registration or nationally recognized equivalent with at least 5 years of experience in the design, fabrication, or examination of industrial pressure piping. (3) be a certified welding inspector or a senior certified welding inspector as defined in AWSQC1, Standard for AWS Certification of Welding Inspectors, or nationally recognized equivalent with at least 5 years of experience in the design,	Designation of owner's Inspector is by Construction Management	LANL	

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			fabrication, or examination of industrial pressure piping. (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 at least 5 years of experience in the design, fabrication, or examination of industrial pressure piping. (c) In delegating performance of inspection, the owner’s Inspector is responsible for determining that a person to whom an inspection function is delegated is qualified to perform that function.			
8	341 Examination	341.4.1 Examination – Normal Fluid Service	(c) Certifications and Records The examiner shall be assured, by examination of certifications, records, and other evidence, that the materials and components are of the specified grades and that they have received required heat treatment, examination, and testing. The examiner shall provide the Inspector with a certification that all the quality control requirements of the Code and of the engineering design have been carried out	Certification that all the quality control requirements of the Code and of the engineering design have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades and have the required heat treatment, examination, and testing.	Subcontractor or LANL if self-performed	
9	341 Examination	341.4.3 Examination – Severe Cyclic Conditions.	(d) Certification and Records. The requirements of para. 341.4.1(c) apply.	Certification that all the quality control requirements of the Code and of the engineering design have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades and have the required heat	Subcontractor or LANL if self-performed	

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				treatment, examination, and testing.		
10	341 Examination	341.4.4 Examination – Elevated Temperature Fluid	(d) Certification and Records. The requirements of para. 341.4.1(c) apply.	Certification that all the quality control requirements of the Code and of the engineering design have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades and have the required heat treatment, examination, and testing.	Subcontractor or LANL if self-performed	
	345.2 General Requirements for Leak Tests		345.2.7 Test Records Records shall be made of each piping system during the testing, including (a) date of test (b) identification of piping system tested (c) test fluid (d) test pressure (e) certification of results by examiner These records need not be retained after completion of the test if a certification by the Inspector that the piping has satisfactorily passed pressure testing as required by this Code is retained.	Suitable test records or acceptance of the owner’s Inspector	Test records Subcontractor or LANL if self-performed Or owner’s Inspector certification	
11	346 Records	346.3 Retention of Records	Unless otherwise specified by the engineering design, the following records shall be retained for at least 5 years after the record is generated for the project: (a) examination procedures (b) examination personnel qualifications (c) examination reports	Create examination records: (a) examination procedures (b) examination personnel qualifications (c) examination reports	Subcontractor or LANL if self-performed	
Non-Metallic Piping						
12	A328.2 Bonding Qualifications	A328.2.1 Qualification Requirements	(a) Qualification of the BPS to be used, and of the performance of bonders and bonding operators, is required.	Records of BPS and Bonding PQR available where the work is being done	LANL for self-performed and for work done at LANL;	

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					Subcontractor for work done on or offsite	
13	A328.2 Bonding Qualifications	A328.2.2 Procedure Qualification by Others	Subject to the specific approval of the Inspector, a BPS qualified by others may be used provided that...	Inspector acceptance	LANL	
14	A328.2 Bonding Qualifications	A328.2.3 Performance Qualification by Others	Without the Inspector's specific approval, an employer shall not accept a performance qualification test made by a bonder or bonding operator for another employer	Inspector acceptance	LANL	
15	A328.2 Bonding Qualifications	A328.2.4 Qualification Records	The employer shall maintain a self-certified record, available to the owner or owner's agent and to the Inspector, of the BPS used and the bonders or bonding operators employed by him/her, and showing the dates and results of BPS qualifications and bonding performance qualifications	Records of BPS and Bonding PQR available where the work is being done	LANL for self-performed and for work done at LANL; Subcontractor for work done on or offsite	
16		A328.5.1 General	In lieu of marking the bond, appropriate records may be filed.	Records of each bond shall be retained denoting the location and bonder(s) so if welds must be removed they may be located	Subcontractor or LANL if self-performed	
17	A329.2 Flaring of Nonmetallic Linings	A329.2.1 General	(a) Paragraph A329.2 applies only to the flaring of linings in pipe that has previously been lined with nonmetals. (b) Flaring that conforms to para. A329.2 may be used in accordance with para. A318.3.2. (c) 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 procedure specification.	Documented procedure and qualification of operator	Subcontractor or LANL if self-performed	
18		A341.4.1 Examination	(c) Certifications and Records. Paragraph 341.4.1(c) applies.	Certification that all the quality control requirements of the Code and of the engineering design	Subcontractor or LANL if self-performed	

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		Normally Required.		have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades and have the required heat treatment, examination, and testing.		
19	A346 RECORDS		Paragraph 346 applies in its entirety.	Create examination records: (a) examination procedures (b) examination personnel qualifications (c) examination reports	Subcontractor or LANL if self-performed	
Fluid Category M (Toxics)						
20	Part 7 Metallic Materials M323 General Requirements	M323.1.4 Reclaimed Metallic Materials.	Reclaimed materials may be used when the material certification records are available for the specific materials employed, and the designer is assured that the material is sound and free from harmful defects.	CMTR of reclaimed materials	Subcontractor or LANL if self-performed	
Fluid Category High Pressure						
21	Part 7 Materials K323 General Requirements	K323.3.1 General	K323.3.1 General. Except as provided in Table K323.3.1, Note (2), piping components used in High Pressure Fluid Service shall be subjected to Charpy V-notch impact testing. The testing shall be performed in accordance with Table K323.3.1 on representative samples using the testing methods described in paras. K323.3.2, K323.3.3, and K323.3.4. Acceptance criteria are described in para. K323.3.5.	Charpy V-notch tests of representative piping components	Subcontractor or LANL if self-performed	
22	Part 7 Materials K323 General Requirements	Table K323.3.1 Impact Testing Requirements	(2) Unless otherwise specified in this Chapter [see Note (4)] or the engineering design, test pieces need not be made from individual material lots, or from material for each job, provided	Charpy V-notch tests of welds	Subcontractor or LANL if self-performed	

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			welds in other certified material of the same thickness ranges and to the same specification (type and grade, not heat or lot) have been tested as required and the records of those tests are made available.			
23	K328 Welding	K328.2.2 Procedure Qualification by Others.	Qualification of welding procedures by others is not permitted.	Records of WPS available were the work is being done.	LANL for self-performed for work done at LANL; Subcontractor for work done on or offsite	
24	K328 Welding	K328.2.3 Performance Qualification by Others.	Welding performance qualification by others is not permitted.	Records of welding PQR available were the work is being done.	LANL for self-performed for work done at LANL; Subcontractor for work done on or offsite	
25	K328 Welding	K328.2.4 Qualification Records.	Paragraph 328.2.4 applies.	Records of Welding and brazing procedures specification and qualifications available were the work is being done.	LANL for self-performed for work done at LANL; Subcontractor for work done on or offsite	
26	K341 Examination	K341.4.3 Certifications and Records.	Paragraph 341.4.1(c) applies.	Certification that all the quality control requirements of the Code and of the engineering design have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades and have the required heat treatment, examination, and testing.	Subcontractor or LANL if self-performed	
27	K344.6 Ultrasonic Examination	K344.6.2 Pipe and Tubing	(c) Records. For pipe and tubing that passes this examination, a report shall be prepared that contains at least the information specified in 15.2.1 through 15.2.6 of ASTM E213.	Record of Ultrasonic Examination	Subcontractor or LANL if self-performed	

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28	K344.8 Eddy Current Examination	K344.8.3 Records.	For pipe and tubing that passes this examination, a report shall be prepared that includes at least the following information: (a) material identification by type, size, lot, heat, etc. (b) listing of examination equipment and accessories (c) details of examination technique (including examination speed and frequency) and end effects, if any (d) description of the calibration standard, including dimensions of the notch, as measured (e) examination results	Eddy Current Examination Report (a) material identification by type, size, lot, heat, etc. (b) listing of examination equipment and accessories (c) details of examination technique (including examination speed and frequency) and end effects, if any (d) description of the calibration standard, including dimensions of the notch, as measured (e) examination results	Subcontractor or LANL if self-performed	
29	K346 Records	K346.2 Required Records	At least the following records, as applicable, shall be provided to the owner or the Inspector by the person responsible for their preparation: (a) the engineering design (b) material certifications (c) procedures used for fabrication, welding, heat treatment, examination, and testing (d) repair records of materials and piping components listed in Table K326.1 or unlisted components in accordance with para. K302.2.3(a), including the welding procedure used for each, and location of repairs (e) performance qualifications for welders and welding operators (f) qualifications of examination personnel (g) records of examination of pipe and tubing for longitudinal defects as specified in paras. K344.6.2(c) and K344.8.3, as applicable	Required Records (a) the engineering design (b) material certifications (c) procedures used for fabrication, welding, heat treatment, examination, and testing (d) repair records of materials and piping components listed in Table K326.1 or unlisted components in accordance with para. K302.2.3(a), including the welding procedure used for each, and location of repairs (e) performance qualifications for welders and welding operators (f) qualifications of examination personnel (g) records of examination of pipe and tubing for longitudinal defects as specified in paras.	Subcontractor or LANL if self-performed	

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				K344.6.2(c) and K344.8.3, as applicable		
30	K346 Records	K346.3 Retention of Records	Paragraph 346.3 applies.	Minimum record retention	Subcontractor or LANL if self-performed	
APPENDIX A ALLOWABLE STRESSES AND QUALITY FACTORS FOR METALLIC PIPING AND BOLTING MATERIALS						
31	NOTES FOR TABLES A-1, A-1M, A-1A, A-1B, A-2, AND A-2M	Note 14	For use in Code piping at the stated stress values, the required minimum tensile and yield properties must be verified by tensile test. If such tests are not required by the material specification, they shall be specified in the purchase order.	Report required showing material properties of tensile and yield strength.	Subcontractor or LANL if self-performed	
Appendix R						
32	Appendix R Use of Alternative Ultrasonic Acceptance Criteria	R305 DATA RECORDING AND CAPTURE	Data shall be recorded in the unprocessed form as specified in Section V, Article 4, V-471.6. The data record shall include the complete examination area as specified in para. R304(b).	Examination and Report requirements in lieu of those described in paragraph 344.6.	Subcontractor or LANL if self-performed	

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B31.3-2016 Owner Approval						
Metallic Material						
33	300 GENERAL STATEMENTS	(b) Responsibilities (1) Owner	The owner is also responsible for designating piping in Category D, Category M, High Pressure, and High Purity Fluid Services, and for determining if a specific Quality System is to be employed.	ESM Chapter 17 or Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
34	300 GENERAL STATEMENTS	(c) Intent of the Code	(3) The Code generally specifies a simplified approach for many of its requirements. 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 design criteria of this Code. These details shall be adequate for the owner to verify the validity and shall be approved by the owner. The details shall be documented in the engineering design.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
35	300 GENERAL STATEMENTS		(f) Code Cases. ASME issues Code Cases that are applicable to this Code. The Code Cases (1) modify the requirements of this Code (2) are applicable from the issue date until the Cases are annulled (3) may be used only when approved by the owner. When so approved, the Code Cases shall be specified in the engineering design and become requirements of this Code.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
36	301 Design Conditions	301.1 Qualifications of the Designer	The Designer is the person(s) in charge of the engineering design of a piping system and shall be experienced in the use of this Code. The qualifications and experience required of the Designer will depend on the complexity and criticality of the system and the nature of the	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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			individual's experience. The owner's approval is required if the individual does not meet at least one of the following criteria:			
37	302 Design Criteria	302.2 Pressure–Temperature Design Criteria 302.2.1 Listed Components Having Established Ratings.	Except as limited elsewhere in the Code, pressure–temperature ratings contained in standards for piping components listed in Table 326.1 are acceptable for design pressures and temperatures in accordance with this Code. When the owner approves , provisions of this Code may be used to extend the pressure–temperature ratings of a component beyond the ratings contained in the listed standard.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
38	302 Design Criteria	302.2.4 Allowances for Pressure and Temperature Variations.	(f) Occasional variations above design conditions shall remain within one of the following limits for pressure design. (1) Subject to the owner's approval , it is permissible to exceed the pressure rating or the allowable stress for pressure design at the temperature of the increased condition by not more than...	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
39	302 Design Criteria	302.3.5 Limits of Calculated Stresses Due to Sustained Loads and Displacement Strains	(2) With the owner's approval , extensive successful experience may be used to justify the factor W above that shown in Table 302.3.5.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
40	304 Pressure Design of Components	304.7.2 Unlisted Components	Pressure design of unlisted components to which the rules elsewhere in para. 304 do not apply shall be based on the pressure design criteria of this Code. The designer shall ensure that the pressure design has been substantiated through one or more of the means stated in subparas. (a) through (e) below. Note that designs are also required to be checked for adequacy of mechanical strength as described in para. 302.5. Documentation showing compliance with this	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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			paragraph shall be available for the owner's approval.			
41	322 Specific Piping Systems	322.6.3 Pressure-Relieving Devices	(1) With the owner's approval the set pressure may exceed the limits in Section VIII, Division 1, provided that the limit on maximum relieving pressure stated in (c) below will not be exceeded.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
42	328 Welding and Bazing	328.2.2 Procedure Qualification by Others	In order to avoid duplication of effort and subject to the approval of the owner , WPSs and BPSs qualified by a technically competent group or agency may be used provided the following are met:	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
43	328 Welding and Bazing	328.2.3 Performance Qualification by Others	In order to avoid duplication of effort and subject to the approval of the owner , an employer may accept the performance qualification of a welder, brazer, or operator made by a previous employer.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
44	331 Heat Treatment	331.2.2 Exceptions to Basic Requirements.	When provisions less stringent than those in para. 331 are specified, the designer must demonstrate to the owner's satisfaction the adequacy of those provisions by comparable service experience, considering service temperature and its effects, frequency and intensity of thermal cycling, flexibility stress levels, probability of brittle failure, and other pertinent factors. In addition, appropriate tests shall be conducted, including WPS qualification tests.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
45	345 TESTING	345.1 Required Leak Test	(a) At the owner's option, a piping system in Category D fluid service may be subjected to an initial service leak test in accordance with para. 345.7, in lieu of the hydrostatic leak test. (b) Where the owner considers a hydrostatic leak test impracticable , either a pneumatic test in accordance with para. 345.5 or a combined hydrostatic-pneumatic test in accordance with para. 345.6 may be substituted, recognizing the	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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			hazard of energy stored in compressed gas. (c) Where the owner considers both hydrostatic and pneumatic leak testing impracticable, the alternative specified in para. 345.9 may be used if both of the following conditions apply:			
46	345 TESTING	345.2.4 Externally Pressured Piping	(b) As an alternative to leak testing under internal pressure, piping systems designed for vacuum service only may be subjected to a vacuum leak test method, technique, and acceptance criteria specified by the owner.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
47	345 TESTING	345.2.6 Repairs or Additions After Leak Testing.	If repairs or additions are made following the leak test, the affected piping shall be retested, except that for minor repairs or additions the owner may waive retest requirements when precautionary measures are taken to assure sound construction.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
48	345 TESTING	345.3.1 Joints Exposed	(c) At the owner's option, joints in Category D Fluid Service that are subject to a hydrostatic leak test (para. 345.4) or an initial service leak test (para. 345.7) may be insulated and have protective weather sheathing installed prior to leak testing. Consideration shall be given to increasing the test period to allow time for possible leakage to pass through the insulation and weather sheathing.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
49	345 TESTING	345.4.3 Hydrostatic Test of Piping With Vessels as a System	b) Where the test pressure of the piping exceeds the vessel test pressure, and it is not considered practicable to isolate the piping from the vessel, the piping and the vessel may be tested together at the vessel test pressure, provided the owner approves and the vessel test pressure is not less than 77% of the piping test pressure calculated in accordance with para. 345.4.2(b).	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
50	345 TESTING	345.7 Initial Service Leak Test	This test is applicable only to piping in Category D Fluid Service, at the owner's option. See para. 345.1(a).	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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Non-Metallic Materials						
51	A323 General Requirements	A323.4.2 Specific Requirements	(a) Thermoplastics (1) They shall not be used in flammable fluid service above ground, unless all of the following are met: (a) The size of the piping does not exceed DN 25 (NPS 1). (b) Owner's approval is obtained.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
52	A345.5 Pneumatic Leak Test	A345.5.1 Precautions	In addition to the requirements of para. 345.5.1, a pneumatic test of nonmetallic piping is permitted only with the owner's approval, and precautions in Appendix F, para. FA323.4 should be considered.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
Fluid Service High Pressure						
53	K302 Design Criteria	K302.2.1 Listed Components Having Established Ratings.	Pressure-temperature ratings for certain piping components have been established and are contained in some of the standards in Table K326.1. Unless limited elsewhere in this Chapter, those ratings are acceptable for design pressures and temperatures under this Chapter. With the owner's approval, the rules and limits of this Chapter may be used to extend the pressure- temperature ratings of a component beyond the ratings of the listed standard, but not beyond the limits stated in para. K323.2.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
54	K304 Pressure Design of High Pressure Components	K304.8.4 Fatigue Evaluation by Test.	With the owner's approval, the design fatigue life of a component may be established by destructive testing in accordance with para. K304.7.2 in lieu of the above analysis requirements.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
55	Part 7 Materials K323 General Requirements	K323.1.6 Repair of Materials by Welding.	A material defect may be repaired by welding, provided that all of the following criteria are met: (c) The repair and its examination are performed in accordance with the material specification and with the owner's approval.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
56	K326 Requirements for Components	K326.4 Repair of Piping	A defect in a component listed in Table K326.1 or in an unlisted component in accordance with para. K302.2.3(a) may be repaired by welding,	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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		Components by Welding	provided that all of the following criteria are met: (c) The repair and its examination are performed in accordance with the component specification and with the owner's approval.			
57	K328 Welding	K328.3.1 Filler Metal.	Filler metal shall be specified in the engineering design and shall conform to the requirements of the BPV Code, Section IX. A filler metal not yet incorporated in Section IX may be used with the owner's approval if a procedure qualification test, including an all-weld-metal test, is first successfully made.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
58	K341 Examination	K341.3.3 Defective Components and Workmanship	b) When specified in the engineering design and with the owner's approval, ultrasonic examination of welds may be substituted for radiographic examination where $T_w \geq 13 \text{ mm}$ (1/2 in.).	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
59	K345 Leak Testing	K345.1 Required Leak Test	(d) With the owner's approval, pressure-relieving devices to be used during operation may be included in the leak test required in (b) above. The leak test pressure may be reduced to prevent the operation of, or damage to, the pressure-relieving devices, but shall not be less than 90% of the lowest set pressure of the pressure-relieving devices in the system.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
Fluid Service High Purity						
60	U328 Welding	U328.4.4 Preparation of Weld Coupons	(2) Production weld coupons may be made in accordance with para. U328.4.4(b)(1) or, at the owner's discretion, may be cut from actual production welds. The weld coupons shall be selected to ensure that the work product of each welding operator doing the production welding is represented.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
61	U342 Examination Personnel	U342.2 Specific Requirement	(2) with the owner's approval, the personnel performing the production work shall be permitted to perform the examination, provided the personnel meet the personnel qualification and certification requirements in para. 342.1	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
62	U345 Testing	U345.1 Required Leak Test	Paragraph 345.1 applies, except that, at the owner's option, a helium mass spectrometer test in accordance with para. U345.8.1 may be substituted for the hydrostatic leak test.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
Appendix X Metallic Bellows Expansion Joints						
63	X302 Expansion Jo9int Manufacturer Responsibilities	X302.1.2 Design Stress Limits.	For convoluted type bellows, stresses shall be calculated either by the formulas shown in the EJMA standards or by other methods acceptable to the owner.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
64	X302 Expansion Jo9int Manufacturer Responsibilities	X302.1.3 Fatigue Analysis	(e) An alternate fatigue correction factor, f_c , may be used with the permission of the owner.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
65	X302 Expansion Jo9int Manufacturer Responsibilities	328.2.2 Procedure Qualification by Others	In order to avoid duplication of effort and subject to the approval of the owner, WPSs and BPSs qualified by a technically competent group or agency may be used provided the following are met:	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.3-2016 Qualifications						
Metallic Piping						
66	301 Design Conditions	301.1 Qualifications of the Designer	<p>The Designer is the person(s) in charge of the engineering design of a piping system and shall be experienced in the use of this Code. The qualifications and experience required of the Designer will depend on the complexity and criticality of the system and the nature of the individual's experience. The owner's approval is required if the individual does not meet at least one of the following criteria:</p> <p>(a) Completion of a degree, accredited by an independent agency [such as ABET (U.S. and international), NBA (India), CTI (France), and CNAP (Chile)], in engineering, science, or technology, requiring the equivalent of at least 4 years of full-time study that provides exposure to fundamental subject matter relevant to the design of piping systems, plus a minimum of 5 years experience in the design of related pressure piping.</p> <p>(b) Professional Engineering registration, recognized by the local jurisdiction, and experience in the design of related pressure piping.</p> <p>(c) Completion of an accredited engineering technician or associates degree, requiring the equivalent of at least 2 years of study, plus a minimum</p>	<p>Variance/Alternative Method Form 2137 as Alternative Method for designer not meeting the criteria</p> <p>Employee records</p>	<p>LANL Owner approved, COE website storage</p> <p>Subcontractor or LANL if self-performed</p>	

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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			of 10 years experience in the design of related pressure piping. (d) Fifteen years experience in the design of related pressure piping. Experience in the design of related pressure piping is satisfied by piping design experience that includes design calculations for pressure, sustained and occasional loads, and piping flexibility.			
67	328.2 Welding and Brazing Qualification	328.2 Welding and Brazing Qualification	Welders, brazers, and operators shall be qualified as required by the ASME BPV Code, Section IX except as modified by para. 333 for brazing of Category D Fluid Service piping and by the following subparagraphs			
68	328.2 Welding and Brazing Qualification	328.2.4 Qualification Records	The employer shall maintain copies of the procedure and performance qualification records specified by Section IX that shall be available to the Inspector at the location where welding is being done.	Records of WPS and PQR available where the work is being done	LANL for self-performed for work done at LANL; Subcontractor for work done on or offsite	