Attachment B. Facility and other Non-R&D Pressure System Certification Process

1. Determine if it is a new design or a major system modification (defined by Ch 17 GEN-1) of an existing system. If yes, continue; otherwise exit review/certification process.
2. Reference Table FAC-REVIEW below to determine the review requirements based on the type of pressure system.
3. Reference Table FAC-DOCS to determine the required documentation for the reviews. The Code of Record will define the documentation requirements along with ADMIN-1-4, *New System Document Requirements*.
    a. ADMIN-1-4, *New System Document Requirements*
    b. ADMIN-1-B31.1-DOCS, *Minimum System Documentation Requirements for B31.1*
    c. ADMIN-1-B31.3-DOCS, *Minimum System Documentation Requirements for B31.3*
    d. ADMIN-1-B31.5-DOCS, *Minimum System Documentation Requirements for B31.5*
    e. ADMIN-1-B31.8-DOCS, *Minimum System Documentation Requirements for B31.8*
    f. ADMIN-1-B31.9-DOCS, *Minimum System Documentation Requirements for B31.9*

    Note: There are code citations for the following for each COR in the documents b–f above:
    a. Documentation
    b. Owner reviews
    c. Qualifications
4. Review the appropriate documentation table (a–f of line 3 above) with a PSO to determine what lines are applicable.
5. In each of the three categories (documentation, owner reviews, and qualification), there is a column titled "How" and "Who"; meaning what is required and who is required to do it.
6. If the PSO determine the line is applicable to the system he/she enters "Yes" or "Y".

Table FAC-REVIEW New or Modified System Review Requirements

Type of Pressure System	Owner's Inspector	PSO Review	PSO B Certification Required	CPSO/DCPSO Review	CPSO/DCPSO Certification Required
Under 1000 pound-foot energy level and nontoxic, nonflammable, not oxygen, not corrosive, not steam, not cryogenic, not high temperature, and not LANL-fabricated component Treated as Exempt; verify relief protection	Not Required		No	No	No
High Pressure – Pneumatic	Required		Yes	Required	Yes
Toxics (Category M)	Required		Yes	Required	Yes
High Pressure Steam above 15 psig	Required		Yes	Required	Yes
High Temperature Service	Required		Yes	Required	Yes
High Pressure – Liquid High Volumetric Rate	Required		Yes	Required	Yes

Attachment B. Facility and other Non-R&D Pressure System Certification Process

Type of Pressure System	Owner's Inspector	PSO Review	PSO B Certification Required	CPSO/DCPSO Review	CPSO/DCPSO Certification Required
Brittle Failure Mode (not leak before burst)	Required		Yes	Required	Yes
Pyrophoric	Required		Yes	Required	Yes
Corrosive	Required		Yes	Required	Yes
Oxygen and other Strong Oxidizers	Required		Yes	Required	Yes
Flammables	Required		Yes	No	No
Cryogenic Liquids	Required		Yes	No	No
Natural Gas Distribution/Transmission	Required		Yes	No	No
Compressed Gas > 150 psig	Required		Yes	No	No
Compressed Inert Gases – DOT Cylinders greater than 2 cubic feet	Required		Yes	No	No
Low Pressure Steam 15 psig max	Required	Not Required	No	No	No
Hot Water	Required	Not Required	No	No	No
Steam Condensate	Required	Not Required	No	No	No
Compressed Gas ≤150 psig	Required	Not Required	No	No	No
Compressed Inert Gases – DOT Cylinders less than 2 cubic feet	Required	Not Required	No	No	No
Compressed Inert Gases – Building Systems	Required	Not Required	No	No	No
High Pressure –Low Liquid Volume	Required	Not Required	No	No	No
Refrigeration Systems	Required	Not Required	No	No	No
Hydronic piping	Required	Not Required	No	No	No
Water Systems	Required	Not Required	No	No	No

Table FAC-DOCS Documentation Required for New or Modified Facility and other Non-R&D Systems

	All Codes of Record	Additional Code of Record Documentation				
Type of Pressure System	**New System Required Documentation**	**B31.9**	**B31.3**	**B31.1**	**B31.8**	**B31.5**
SC/SS (ML1/ML2)[1]	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
High Pressure – Pneumatic	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
High Temperature Service	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Toxics (Category M)	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
High Pressure Steam	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	ADMIN-1-B31.1-DOCS	none	none
High Pressure – Liquid High Volumetric Rate	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Pyrophoric	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Corrosive[1]	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Brittle Failure Mode (not leak before burst)	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Oxygen and other Strong Oxidizers	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	none	ADMIN-1-B31.3-DOCS	none	none	none
Flammables	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	None	ADMIN-1-B31.3-DOCS	ADMIN-1-B31.1-DOCS	None	None

[1] DOE O 420.1C requires B31.3 for ML1 and ML2

	All Codes of Record	Additional Code of Record Documentation				
Type of Pressure System	**New System Required Documentation**	**B31.9**	**B31.3**	**B31.1**	**B31.8**	**B31.5**
Cryogenic Liquids	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	None	ADMIN-1-B31.3-DOCS	None	None	None
Natural Gas Distribution/Transmission	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	None	None	None	ADMIN-1-B31.8-DOCS	None
Compressed Gas > 150 psig	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	None	ADMIN-1-B31.3-DOCS	None	None	None
Compressed Inert Gases – DOT Cylinders greater than 2 cubic feet	ADMIN 1-4, Owner Inspector Reports, As Build Documentation	None	ADMIN-1-B31.3-DOCS	None	None	None
Low Pressure Steam	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Hot Water	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Steam Condensate	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Compressed Gas ≤150 psig	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Compressed Inert Gases – DOT Cylinders less than 2 cubic feet	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Compressed Inert Gases – Building Systems	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
High Pressure –Low Liquid Volume	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Refrigeration Systems	Owner Inspector Reports, As Build Documentation	None	None	None	None	ADMIN-1-B31.5-DOCS
Hydronic piping	Owner Inspector Reports, As Build Documentation	None	None	None	None	None
Water Systems	Owner Inspector Reports, As Build Documentation	None	None	None	None	None

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)
B31.1-2018 Required Minimum Documentation						
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

No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			(g) valve and other inline equipment data used in original piping design stress analysis *(h)* additional documentation requirements as identified in paras. 141.2, 141.3, 141.4, and 141.5	*(g)* valve and other inline equipment data used in original piping design stress analysis		
4	139 Operation and Maintenance Procedures	(referenced from 141.1 General)	For *(Covered Piping System -ed)* 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	*(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	LANL	
5	140 Condition Assessment of CPS	(referenced from 141.1 General)	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	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:	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)
			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 Operating Company, should contain (but not be limited to) as many of the following elements as available: *(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 Nonmandatory Appendix V, para. V-11 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 para. 146).	*(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 Nonmandatory Appendix V, para. V-11 for examples) that produced visual evidence of distortion or damage. Repetitive dynamic events (with or without visual evidence) should be		

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)
			(k) actual pipe wall thickness and outside diameter measurements taken since the last condition assessment as appropriate based on service. *(l)* summary of pipe system inspection findings, including list of areas of concern. *(m)* recommendations for reinspection interval and scope. Guidance on condition assessment may be found in Nonmandatory Appendix V of this Code.	included when identified by operators or plant personnel (see para. 146). *(k)* actual pipe wall thickness and outside diameter measurements taken since the last condition assessment as appropriate based on service. *(l)* summary of pipe system inspection findings, including list of areas of concern. *(m)* recommendations for reinspection interval and scope. Guidance on condition assessment may be found in Nonmandatory Appendix V of this Code.		
6	141 CPS Records	141.2 Materials	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. The records listed below are to be included in the material history and be traceable to specific components in a piping system. Additional records may be included as deemed necessary. *(a)* procurement documents, including specifications *(b)* original service date and original operating parameters *(c)* list of materials, both original and replacement, with system location and material specification *(d)* physical and mechanical properties from material test reports, including the following as applicable: *(1)* Manufacturer's Material Test Reports or Certificate of Conformance *(2)* chemical composition data *(3)* impact test data *(4)* information regarding special processing, i.e., welding, postweld heat treatment, mechanical working, bending including post-bending heat treatment, etc.	procurement documents, including specifications *(b)* original service date and original operating parameters *(c)* list of materials, both original and replacement, with system location and material specification *(d)* physical and mechanical properties from material test reports, including the following as applicable: *(1)* Manufacturer's Material Test Reports or Certificate of Conformance *(2)* chemical composition data *(3)* impact test data	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)
			(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	*(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		
7	141 CPS Records	141.3 Installation, Modification, and Repair	Records for pressure-retaining welds in covered piping systems shall include, 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	*(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	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.	

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No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.1-2018 Owner Approval						
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 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	
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 owner's approval. 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 selection of the device should be a matter of mutual agreement between the owner 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 owner's approval 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 owner approval.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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17	123.1 Materials and Specifications	123.1.2 Unlisted Materials	(d) The designer shall document the owner's acceptance 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 approval of the owner, 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 approval of the owner, 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, the owner is responsible for determining that a person to whom an inspection function is delegated is qualified to perform that function.	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 acceptance standards beyond the requirements of this Code shall be a matter of prior agreement between the manufacturer, fabricator, or erector and the owner.	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 approval of the owner. 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	

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			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 unless otherwise specified by the owner.	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 owner shall be aware 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, when specified by the owner, 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 unless otherwise specified by the owner.	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 unless the owner specifies pneumatic testing or permits its use as an alternative.	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	When specified by the owner, 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	When specified by the owner, 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		At the owner's discretion, 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) Owner's approval is obtained. 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 without the owner's specific approval. 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 the owner.	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 or by other methods acceptable to the owner.	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, fc, may be used with the permission of the owner.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	

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No.	B31.1 Code Heading	B31.1 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.1-2018 Qualifications						
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			

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	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			

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			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			

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

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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 were 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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			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 inAWSQC1, 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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			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 an 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 an have the required heat	Subcontractor or LANL if self-performed	

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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
				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 an 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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
					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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
		Normally Required.		have been met. This includes examination of certifications, records, and other evidence, that the materials and components are of the specified grades an 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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			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 qualifciations 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 an 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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
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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No.	B31.3[1] Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
				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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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
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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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			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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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
			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 protectiveweather 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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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
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 Critera	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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No.	B31.3 Code Heading	B31.3 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
		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 Tw ≥ 13 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 Personel	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, fc, 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	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: (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. (b) Professional Engineering registration, recognized by the local jurisdiction, and experience in the design of related pressure piping. (c) Completion of an accredited engineering technician or associates degree, requiring the equivalent of at least 2 years of study, plus a minimum	Variance/Alternative Method Form 2137 as Alternative Method for designer not meeting the criteria Employee records	LANL Owner approved, COE website storage Subcontractor or LANL if self-performed	

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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	

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No.	B31.5 Code Heading	B31.5 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.5-2016 Minimum Required Records						
1	519.4 Analysis for Bending Flexibility	519.4.2 Flexibility	Adequate flexibility may generally be assumed to be available in systems that (a) are duplicates of successfully operating installations or replacements of systems with a satisfactory service record			
2	527.4 Responsibility	527.4.3 Procedure Qualification by Others.	(c) The employer's business name shall be shown on each WPS or BPS and on each qualification record. In addition, qualification records shall be signed and dated by the employer, thereby accepting responsibility for the qualifications performed by others.			
3	527.4 Responsibility	527.4.4 Performance Qualification by Others	An employer accepting such qualification tests shall obtain a copy of the performance qualification test record from the previous employer. The record shall show the name of the employer by whom the welder, brazer, or operator was qualified and the date of that qualification. A record shall be available showing use of each process at no less than 6-mo intervals from the date of qualification with that process to the date that the qualification record is transferred to the new employer. The new employer's business name shall be shown on the qualification record, and it shall be signed and dated by the employer, thereby accepting responsibility for the qualifications performed by others.			
4	527.5 Qualification Records	527.5 Qualification Records	The employer shall maintain copies of the procedure and performance qualification records specified by ASME Section IX, which shall be available to the owner or the owner's agent and the Inspector at the location where welding is being done. After completing a welded joint, the welder or welding operator shall identify it as his or her work by applying his or her assigned letter, number, or symbol as a permanent record in a manner specified by his or her employer.			

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No.	B31.5 Code Heading	B31.5 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
5	537 INSPECTION	537.3 Rights of Inspectors	Inspectors shall have the right to review all records pertaining to the examination requirements of section 536.	536 includes 536.4 Required Examinations includes visual examination and random radiography to A and 536.5 Supplementary Examination that may be specified in the engineering design that include In-Process examination, Radiographic examination, Ultrasonic Examination,		
6	539 RECORDS	539.3 Extent and Retention of Records	The following records shall be maintained for 3 yr: (a) procedure specification, procedure qualification, and performance qualification records (b) results of weld examinations other than visual (c) records of the testing of each piping system, which shall include the following information: (1) date (2) identification of piping system tested (3) testing medium (4) test pressure (5) signature of examiner and inspector	(a) procedure specification, procedure qualification, and performance qualification records (b) results of weld examinations other than visual (c) records of the testing of each piping system, which shall include the following information: (1) date (2) identification of piping system tested (3) testing medium (4) test pressure (5) signature of examiner and inspector		
Owner Approval						
7	527.4 Responsibility	527.4.3 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:	527.4.1 Qualification Requirements. WPSs and BPSs to be followed in production welding shall be prepared and qualified. Welders, brazers, and operators shall be qualified as required by Section IX of the ASME Boiler and Pressure Vessel Code, except as modified in paras. 527.4.2, 527.4.3, and 527.4.4.		

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No.	B31.5 Code Heading	B31.5 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
8	527.4 Responsibility	527.4.4 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.			
9	536.3 Examination Personnel Qualification and Certification	536.3 Examination Personnel Qualification and Certification	The owner shall determine whether examination by other than personnel performing the work is required.			
Qualifications						
10	527.4 Responsibility	527.4.1 Qualification Requirements.	WPSs and BPSs to be followed in production welding shall be prepared and qualified. Welders, brazers, and operators shall be qualified as required by Section IX of the ASME Boiler and Pressure Vessel Code, except as modified in paras. 527.4.2, 527.4.3, and 527.4.4.			

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Notes:

1. 49 CFR 192 contain requirements for natural gas as well
2. B31.8 replaces the reference of owner with "operating company"; *operating company:* as used in this Code, is the individual, partnership, corporation, public agency, owner, agent, or other entity responsible for the design, construction, inspection, testing, operation, and maintenance of the pipeline facilities.

No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
B31.8 Required Minimum Records						
1	802.2 Intent	802.2.2 More Complete Analysis	*(b)* For operation and maintenance, an operating company may choose to use a more rigorous analysis to develop operation and maintenance requirements. When the operating company decides to take this approach, the operating company shall provide details and calculations demonstrating that such alternative practices are consistent with the objectives of this Code. The details shall be documented in the operating records and retained for the lifetime of the facility.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
2	823.3 Welder Requalification Requirements	823.4 Qualification Records	823.4 Qualification Records Records of the tests that establish the qualification of a welding procedure shall be maintained as long as that procedure is in use. The operating company or contractor shall, during the construction involved, maintain a record of the welders qualified, showing the dates and results of tests.	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	
3	833 DESIGN FOR LONGITUDINAL STRESS	833.7 Flexibility Analysis for Unrestrained Piping	(a) There is no need for formal flexibility analysis for an unrestrained piping system that (1) duplicates or replaces without significant change a system operating with a successful record … (b) Any piping system that does not meet one of the criteria in (a) should undergo a flexibility stress analysis by a simplified, approximate, or comprehensive method as deemed appropriate.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
4	840 DESIGN, INSTALLATION, AND TESTING	840.1 General Provisions	(a) The design requirements of this Code are intended to be adequate for public safety under all conditions encountered in the gas industry. Conditions that may cause additional stress in any part of a line or its appurtenances shall be provided for, using good engineering practice. Examples of such conditions include long self-supported spans, unstable ground, mechanical or sonic vibration, weight of special attachments, earthquake induced stresses, stresses caused by temperature differences, and the soil and temperature conditions found in the Arctic. Temperature differences shall be taken as the difference between the lowest and highest expected metal temperature during pressure test and/or operating services having due regard to past recorded temperature data and the possible effects of lower or higher air and ground temperature.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
5	841.1 Steel Piping Systems Design Requirements	841.1.2 Fracture Control and Arrest	(b) Brittle Fracture Control. … The appropriate lower test temperature shall be taken to be at or below the lowest expected metal temperature during pressure testing (if with air or gas) and during service, having regard to past recorded temperature data and possible effects of lower air and ground temperatures…	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
6	841.3 Testing After Construction	841.3.2 Pressure Test Requirements to Prove Strength of Pipelines and Mains to Operate at Hoop Stresses of 30% or More of the Specified Minimum	(i) Operating companies shall retain, in their files, for the useful life of each pipeline and main, records showing the procedures used and the data developed in establishing the maximum allowable operating pressure of that pipeline or main. Refer to section N-7 of Nonmandatory Appendix N for a list of suggested records for retention.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
		Yield Strength of the Pipe.				
7	841.4 Commissioning of Facilities	841.4.5 Documentation and Records.	841.4.5 Documentation and Records. The following commissioning records shall be maintained as permanent records: (a) cleaning and drying procedures (b) cleaning and drying results (c) function-testing records of pipeline monitoring (d) control equipment systems (e) completed prestart checklist	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
8	845.2 Control and Limiting of Gas Pressure	845.2.3 Qualification of a Steel Pipeline or Main to Establish the MAOP	(a) Pipeline Operating at 100 psig (690 kPa) or More. … (3) Records of hydrostatic pressure tests and line repairs shall be preserved as long as the facilities involved remain in service.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
9	845.2 Control and Limiting of Gas Pressure	845.2.3 Qualification of a Steel Pipeline or Main to Establish the MAOP	(b) Pipelines Operating at Less Than 100 psig (690 kPa). (3) Records of pressure tests and line repairs shall be preserved as long as the facilities involved remain in service.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
10	845.2 Control and Limiting of Gas Pressure	845.2.6 Conversion of Low-Pressure Distribution Systems to High-Pressure Distribution Systems	(a) Before converting a low-pressure distribution system to a high-pressure distribution system, it is required that the following factors be considered: … (2) past maintenance records, including results of any previous leakage surveys	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
11	850 OPERATING AND MAINTENANCE	850.2 Basic Requirements	Each operating company having facilities within the scope of this Code shall… (f) keep records to administer the plans and training properly.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
	PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES				LANL; Subcontractor for work done on or offsite	
12	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.4.2 Training Program.	…Program records shall be maintained to establish what training each employee has received and the date of such training.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
13	851 PIPELINE MAINTENANCE	851.6 Pipeline Leak Records	Records shall be made covering all leaks discovered and repairs made. All pipeline breaks shall be reported in detail. These records along with leakage survey records, line patrol records, and other records relating to routine or unusual inspections shall be kept in the file of the operating company, as long as the section of line remains in service.	Recorded in the PSCS or the EDRMS	LANL	
14	852 DISTRIBUTION PIPING MAINTENANCE	852.6 Piping Maintenance Records	852.6.1 Inspection of Underground Piping. Whenever any portion or section of an existing underground distribution piping system is uncovered for operating or maintenance purposes or for the installation of new facilities, the following information shall be recorded: (a) the condition of the surface of bare pipe, if pitted or generally corroded (b) the condition of the pipe surface and of the protective coating where the coating has deteriorated to the extent that the pipe is corroding underneath (c) any damaged protective coating (d) any repairs made	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
15	852 DISTRIBUTION PIPING MAINTENANCE	852.6 Piping Maintenance Records	852.6.2 Cause of Cast Iron Breakage. Whenever broken cast iron facilities are uncovered, the cause of breakage, such as thermal effect, backfill, or construction by others, shall be recorded if it can be determined.	Recorded in the PSCS or the EDRMS	LANL	
16	852 DISTRIBUTION PIPING MAINTENANCE	852.6 Piping Maintenance Records	852.6.3 Analysis of Condition Records. Distribution piping condition records shall be analyzed periodically. Any indicated remedial action on the piping system shall be taken and recorded.	Recorded in the PSCS or the EDRMS	LANL	
17	853 MISCELLANEOUS FACILITIES MAINTENANCE	853.2 Procedures for Maintaining Pipe-Type and Bottle-Type Holders in Safe Operating Condition	(b) Each operating company, having prepared such a plan as prescribed in (a), shall follow the plan and keep records that detail the inspection and testing work done and the conditions found.	Recorded in the PSCS or the EDRMS	LANL	
18	853 MISCELLANEOUS FACILITIES MAINTENANCE	853.3.4 Pressure-Regulating Stations	(a) Every distribution system supplied by more than one pressure-regulating station shall be equipped with telemetering or recording pressure gages to indicate the gas pressure in the district. … (c) If there are indications of abnormal high or low pressures, the regulator and the auxiliary equipment shall be inspected and the necessary measures shall be employed to rectify any unsatisfactory operating conditions. Suitable periodic inspections of single pressure regulation stations not equipped with telemetering or recording gages shall be made to determine that the pressure- regulating equipment is functioning properly.	Recorded in the PSCS or the EDRMS	LANL	
19	853.4 Valve Maintenance	853.4.4 Valve Records.	A record shall be maintained for locating valves covered by paras. 853.4.1 and 853.4.2. These records may be maintained on operating maps, separate files, or summary sheets, and the information on these records shall be readily accessible to personnel required to respond to emergencies.	Recorded in the PSCS or the EDRMS	LANL	
20	854 LOCATION CLASS AND CHANGES IN NUMBER	854.1 Monitoring	(c) When there is an increase in the number of buildings intended for human occupancy to or near the upper limit of the Location Class listed in Table 854.1-1 to the extent that a change in Location Class is likely, a study shall be completed within 6 months of perception of the	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
	OF BUILDINGS INTENDED FOR HUMAN OCCUPANCY		increase to determine the following: …. (2) the physical conditions of the pipeline or main to the extent that this can be ascertained from current tests and evaluation records.			
21	855 PIPELINE SERVICE CONVERSIONS	855.2 Historical Records Study	Review the following historical data and make an evaluation of the pipeline's condition: (a) Study all available information on the original pipeline design, inspection, and testing. Particular attention should be paid to welding procedures used and other joining methods, internal and external coating, pipe, and other material descriptions. (b) Study available operating and maintenance data including leak records, inspections, failures, cathodic protection, and internal corrosion control practices. (c) Consider the age of the pipeline and the length of time it may have been out of service in preparing a final evaluation to convert the pipeline to gas service.	Recorded in the PSCS or the EDRMS	LANL	
22	855 PIPELINE SERVICE CONVERSIONS	855.3 Requirements for Conversion to Gas Service	A steel pipeline previously used for service not subject to this Code may be qualified for service under this Code as follows: (a) Review historical records of the pipeline as indicated in para. 855.2. (b) Inspect all aboveground segments of the pipeline for physical condition. During the inspection, identify the material where possible for comparison with available records.	Recorded in the PSCS or the EDRMS	LANL	
23	855 PIPELINE SERVICE CONVERSIONS	855.5 Records of the Conversion	Maintain for the life of the pipeline a record of the studies, inspections, tests, repairs, replacements, and alterations made in connection with conversion of the existing steel pipeline to gas service under this Code.	Recorded in the PSCS or the EDRMS	LANL	
24	856 ODORIZATION	856.4 Records	For all odorizers, except small wick-type or bypass type, or similar odorizers serving individual customers or small distribution systems, each operating company shall maintain records containing the following items: (a) the type of odorant introduced into the gas (b) the amount of odorant injected per million cubic feet (m3)	Recorded in the PSCS or the EDRMS	LANL	
25	857 UPRATING	857.1 General	(c) Before increasing the maximum allowable operating pressure of a segment that has been operating at a pressure less than that determined by para. 845.2.2, the following investigative and corrective measures shall be	Recorded in the PSCS or the EDRMS	LANL	

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			taken: (1) The design, initial installation, method, and date of previous testing, Location Classes, materials, and equipment shall be reviewed to determine that the proposed increase is safe and consistent with the requirements of this Code. (2) The condition of the line shall be determined by leakage surveys, other field inspections, and examination of maintenance records. (f) Records for uprating, including each investigation required by this section, corrective action taken, and pressure test conducted, shall be retained as long as the facilities involved remain in service.			
26	857 UPRATING	857.4 Uprating a Ductile Iron High-Pressure Main or System to a New and Higher Maximum Allowable Operating Pressure	(a) The maximum allowable operating pressure of a ductile iron main or system shall not be increased to a pressure in excess of that permitted in para. 842.1.1 (a). Where records are not complete enough to permit the direct application of para. 842.1.1(a), the following procedures shall be used:	Recorded in the PSCS or the EDRMS	LANL	
27	Chapter VI Corrosion Control 860 GENERAL	860.1 Scope	(e) Records indicating cathodically protected piping, cathodic protection facilities, and other structures affected by or affecting the cathodic protection system shall be maintained by the operating company. (f) Records of tests, surveys, inspection results, leaks, etc., necessary for evaluating the effectiveness of corrosion control measures shall be maintained and retained for as long as the piping remains in service.	Recorded in the PSCS or the EDRMS	LANL	
28	Chapter VI Corrosion Control 860 GENERAL	860.2 Evaluation of Existing Installations	(b) The records available as a result of leakage surveys and normal maintenance work in accordance with paras. 852.2 and 852.6 shall be continuously reviewed for evidence of continuing corrosion.	Recorded in the PSCS or the EDRMS	LANL	
29	864 INTERNAL CORROSION CONTROL	864.1 General	… (c) Corrosion probes should be checked manually at intervals, or continuously or intermittently monitored, recorded, or both, to evaluate control of pipeline internal corrosion.	Recorded in the PSCS or the EDRMS	LANL	

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			(d) A record of the internal condition of the pipe, of leaks and repairs from corrosion, and of gas, liquids, or solids quantities and corrosivity should be kept and used as a basis for changes in the pigging schedule, inhibitor program, or gas treatment facility. … (f) Where inspections, observation, or record analysis indicates internal corrosion is taking place to an extent that may be detrimental to public or employee safety, that portion of the system shall be repaired or reconditioned, and appropriate steps taken to mitigate the internal corrosion.			
B31.8 Documents						
30	802 SCOPE AND INTENT 802.2 Intent	802.2.2 More Complete Analysis.	(a) 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 operating company details and calculations demonstrating that design, construction, examination, and testing are consistent with the criteria of this Code. These details shall be adequate for the operating company to verify the validity of the approach and shall be approved by the operating company. The details shall be documented in the engineering design. (b) For operation and maintenance, an operating company may choose to use a more rigorous analysis to develop operation and maintenance requirements. When the operating company decides to take this approach, the operating company shall provide details and calculations demonstrating that such alternative practices are consistent with the objectives of this Code. The details shall be documented in the operating records and retained for the lifetime of the facility.	Recorded in the PSCS or the EDRMS	LANL	
31	807 TRAINING AND QUALIFICATIO N OF PERSONNEL	807.1 Program	(h) Identify the documentation requirements needed to adequately manage the program.	Recorded in the PSCS or the EDRMS	LANL	

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32	841 STEEL PIPE 841.3 Testing After Construction	841.4.5 Documentation and Records	The following commissioning records shall be maintained as permanent records: (a) cleaning and drying procedures (b) cleaning and drying results (c) function-testing records of pipeline monitoring (d) control equipment systems (e) completed prestart checklist	Recorded in the PSCS or the EDRMS	LANL	
33	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.4 Essential Features of the Emergency Plan 850.4.1 Written Emergency Procedures	(i) reporting and documenting the emergency	Recorded in the PSCS or the EDRMS	LANL	
34		850.8 Damage Prevention Program	(e) monitoring of excavation activities, as well as direct observation of excavation. Consideration should be given to the frequency of monitoring, criteria for continual observation, actions if the excavator refuses to follow operating company requirements, and documentation to be maintained during observations.	Recorded in the PSCS or the EDRMS	LANL	
35	851 PIPELINE MAINTENANCE	851.4 Repair Procedures for Steel Pipelines	Evaluation of pipeline defects and associated repair methods are discussed in paras. 851.4.1 through 851.4.5. Additional guidance may be found in ASME PCC-2, Repair of Pressure Equipment and Piping, and in the following PRCI documents: Pipeline Repair Manual (original or updated version), and Pipeline Defect Assessment — A Review and Comparison of Commonly Used Methods. Information on these documents is found in Mandatory Appendix A. ‘” Repair materials or equipment for which no standards or specifications are referenced in this Code shall only be permitted if qualified in accordance with para. 811.2.4. Such repairs shall be described in detail in documentation that is retained by the operating company.	Recorded in the PSCS or the EDRMS	LANL	
B31.8 Operating Company						

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36	807 TRAINING AND QUALIFICATION OF PERSONNEL	807.1 Program	Each operating company shall have a program to manage the qualification of personnel who perform operating, maintenance, and construction activities that could impact the safety or integrity of a pipeline. The program shall address, at a minimum, the following elements: …	Recorded in the PSCS or the EDRMS	LANL	
37	807 TRAINING AND QUALIFICATION OF PERSONNEL	807.2 Operating and Maintenance Functions	In addition to the requirements in para. 807.1, each operating company shall provide training for employees in procedures established for operating and maintenance functions. The training shall be comprehensive and designed to prepare employees for service in their area of responsibility.	Recorded in the PSCS or the EDRMS	LANL	
38	823 QUALIFICATION OF PROCEDURES AND WELDERS	823.4 Qualification Records	Records of the tests that establish the qualification of a welding procedure shall be maintained as long as that procedure is in use. The operating company or contractor shall, during the construction involved, maintain a record of the welders qualified, showing the dates and results of tests.	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	
39	826 WELD INSPECTION REQUIREMENTS	826.3 Inspection and Tests for Quality Control of Welds on Piping Systems Intended to Operate at Hoop Stress Levels of 20% or More of the Specified Minimum Yield Strength	The following minimum number of field butt welds shall be selected on a random basis by the operating company from each day's construction for examination. Each weld so selected shall be examined over its entire circumference or else the equivalent length of welds shall be examined if the operating company chooses to examine only a part of the circumference of each. The same minimum percentages shall be examined for double ending at railhead or yard.	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
40	841 STEEL PIPE 841.2 Installation of Steel Pipelines and Mains	841.2.2 Inspection Provisions	(a) The operating company shall provide suitable inspection. Inspectors shall be qualified either by experience or training. The inspector shall have the authority to order the repair or removal and replacement of any component found that fails to meet the standards of this Code.	Recorded in the PSCS or the EDRMS	LANL	
41	841 STEEL PIPE 841.2 Installation of Steel Pipelines and Mains	841.3.2 Pressure Test Requirements to Prove Strength of Pipelines and Mains to Operate at Hoop Stresses of 30% or More of the Specified Minimum Yield Strength of the Pipe.	(f) In selecting the test pressure, the designer or operating company should be aware of the provisions of section 854 and the relationship between test pressure and operating pressure when the pipeline experiences a future increase in the number of dwellings intended for human occupancy.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
42	841 STEEL PIPE 841.2 Installation of Steel Pipelines and Mains	Table 841.3.2-1 Test Requirements for Steel Pipelines and Mains to Operate at Hoop Stresses of 30% or More of the Specified Minimum Yield Strength of the Pipe	(a) This Table defines the relationship between test pressures and maximum allowable operating pressures subsequent to the test. If an operating company decides that the maximum operating pressure will be less than the design pressure, a corresponding reduction in the prescribed test pressure may be made as indicated in the Pressure Test Prescribed, Minimum column. If this reduced test pressure is used, however, the maximum operating pressure cannot later be raised to the design pressure without retesting the line to a higher test pressure. See paras. 805.2.1, 845.2.2, and 845.2.3.	Recorded in the PSCS or the EDRMS	LANL	
43	843 COMPRESSOR STATIONS 843.1 Compressor Station Design	843.1.1 Location of Compressor Building.	Except for offshore pipelines, the main compressor building for gas compressor stations should be located at such clear distances from adjacent property not under control of the operating company as to minimize the hazard of communication of fire to the compressor building from structures on adjacent property. Sufficient	Recorded in the PSCS or the EDRMS	LANL	

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			open space should be provided around the building to permit the free movement of firefighting equipment.			
44	844 PIPE-TYPE AND BOTTLE-TYPE HOLDERS	844.1 Pipe-Type Holders in Rights-of-Way Not Under Exclusive Use and Control of the Operating Company	A pipe-type holder that is to be installed in streets, highways, or in private rights-of-way not under the exclusive control and use of the operating company shall be designed, installed, and tested in accordance with the provisions of this Code applicable to a pipeline installed in the same location and operated at the same maximum pressure.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
45	844 PIPE-TYPE AND BOTTLE-TYPE HOLDERS	844.2 Bottle-Type Holders	Bottle-type holders shall be located on land owned or under the exclusive control and use of the operating company.	Recorded in the PSCS or the EDRMS	LANL	
46	844 PIPE-TYPE AND BOTTLE-TYPE HOLDERS	844.3 Pipe-Type and Bottle-Type Holders on Property Under the Exclusive Use and Control of the Operating Company	(a) The storage site shall be entirely surrounded with fencing to prevent access by unauthorized persons. (b) A pipe-type or bottle-type holder that is to be installed on property under the exclusive control and use of the operating company shall be designed in accordance with construction design factors. The selection of these factors depends on the Location Class in which the site is situated, the clearance between the pipe containers or bottles and the fence, and the maximum operating pressure, as shown in Table 844.3-1. …	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
47	849 GAS SERVICE LINES	849.1.2 Types of Valves Suitable for Service Line Valves	(e) The operating company shall make certain that the service line valves installed on high-pressure service lines are suitable for this use either by making their own tests or by reviewing the tests made by the manufacturers.	Recorded in the PSCS or the EDRMS	LANL	
48	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION	850.1 General	(a) Because of many variables, it is not possible to prescribe in a code a detailed set of operating and maintenance procedures that will encompass all cases. It is possible, however, for each operating company to develop operating and maintenance procedures based on the provisions of this Code, its experience, and its knowledge of its facilities and conditions under which they are operated that will be adequate from the standpoint of public safety. For operating and maintenance procedures relating to corrosion control,	Recorded in the PSCS or the EDRMS	LANL	

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	AND DISTRIBUTION FACILITIES		see Chapter VI. (b) Upon initiating gas service in a pipeline designed and constructed or converted to gas service in accordance with this Code, the operating company shall determine the Location Class in accordance with Table 854.1-1.			
49	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.2 Basic Requirements	Each operating company having facilities within the scope of this Code shall (a) have a written plan covering operating and maintenance procedures in accordance with the scope and intent of this Code. (b) have a written emergency plan covering facility failure or other emergencies. (c) operate and maintain its facilities in conformance with these plans. (d) modify the plans periodically as experience dictates and as exposure of the public to the facilities and changes in operating conditions require. (e) provide training for employees in procedures established for their operating and maintenance functions that is comprehensive and designed to prepare employees for service in their area of responsibility. See section 807 for guidance on the training and qualification of personnel performing tasks that could impact the safety or integrity of a pipeline. (f) keep records to administer the plans and training properly.	Recorded in the PSCS or the EDRMS	LANL	
50	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.4 Essential Features of the Emergency Plan 850.4.1 Written Emergency Procedures.	Each operating company shall establish written procedures that will provide the basis for instructions to appropriate operating and maintenance personnel that will minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures shall provide for the following: (a) a system for receiving, identifying, and classifying emergencies that require immediate response by the operating company (b) indicating clearly the responsibility for instructing employees in the procedures listed in the emergency plans and for training employees in the execution of those procedures (c) indicating clearly those responsible for updating the plan (d) establishing a plan for prompt and adequate handling of all calls that concern emergencies whether they are from customers, the public, company employees, or	Recorded in the PSCS or the EDRMS	LANL	

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			other sources (e) establishing a plan for the prompt and effective response to a notice of each type of emergency *(f)* controlling emergency situations, including the action to be taken by the first employee arriving at the scene *(g)* the dissemination of information to the public *(h)* the safe restoration of service to all facilities affected by the emergency after proper corrective measures have been taken *(i)* reporting and documenting the emergency			
51	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.4.2 Training Program.	Each operating company shall have a program for informing, instructing, and training employees responsible for executing emergency procedures. The program shall acquaint the employee with the emergency procedures and how to promptly and effectively handle emergency situations. …	Recorded in the PSCS or the EDRMS	LANL	
52	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.4.3 Liaison	(a) Each operating company shall establish and maintain liaison with appropriate fire, police, and other public officials, entities in or near the pipeline right-of-way (e.g., electrical and other utilities, highway authorities, and railroads), and news media. See para. 850.9.1 for additional guidance. (b) Each operating company must have a means of communication with appropriate public officials during an emergency. (c) Emergency procedures, including the contingency plan under para. B854.5(e), must be prepared in coordination with appropriate public officials.	Recorded in the PSCS or the EDRMS	LANL	
53	850 OPERATING AND MAINTENANCE	850.5 Pipeline Failure Investigation	Each operating company shall establish procedures to analyze all failures and accidents for determining the cause and to minimize the possibility of a recurrence. This plan shall include a procedure to select samples of the failed facility or equipment for laboratory examination when necessary.	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
	PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES					
54	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.6 Prevention of Accidental Ignition	Smoking and all open flames shall be prohibited in and around structures, or areas under the control of the operating company containing gas facilities (such as compressor stations, meter and regulator stations, and other gas handling equipment), where possible leakage of gas constitutes a hazard of fire or explosion. Each operating company shall take steps to minimize the danger of accidental ignition of gas. …	Recorded in the PSCS or the EDRMS	LANL	
55	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.7 Blasting Effects	Each operating company shall establish procedures for protection of facilities in the vicinity of blasting activities. The operating company shall ….	Recorded in the PSCS or the EDRMS	LANL	
56	850 OPERATING AND MAINTENANCE	850.8 Damage Prevention Program	Each operating company shall have a program to reduce the risk associated with damage to gas facilities resulting from excavation activities. Operators should consider including the following actions in the program: …. (e) monitoring of excavation activities, as well as direct observation of excavation. Consideration should be given	Recorded in the PSCS or the EDRMS	LANL	

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	PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES		to the frequency of monitoring, criteria for continual observation, actions if the excavator refuses to follow operating company requirements, and documentation to be maintained during observations.			
57	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.9 Communication Plan	The operator shall develop and implement a communications plan to provide operating company personnel, jurisdictional authorities, emergency response officials, potential excavators, public officials, and the public with pipeline safety information to help keep communities near pipelines safe. The information may be communicated as part of other required communications.	Recorded in the PSCS or the EDRMS	LANL	
58	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.9.1 External Communications	The following items should be considered for communication to the various interested parties, such as landowners and tenants along the rights-of-way, public officials, local and regional emergency responders, general public, excavators, and one-call centers: (a) operating company name, location, and contact information (both routine and emergency contacts) ….	Recorded in the PSCS or the EDRMS	LANL	
59	850 OPERATING AND MAINTENANCE	850.9.2 Internal Communications.	Operating company management and other appropriate personnel should understand and support the operation and maintenance efforts, damage prevention program, emergency response program, and integrity management program.	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
	PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES					
60	851 PIPELINE MAINTENANCE	851.1 Periodic Surveillance of Pipelines	As a means of maintaining the integrity of its pipeline system, each operating company shall establish and implement procedures for periodic surveillance of its facilities. Studies shall be initiated and appropriate action shall be taken where unusual operating and maintenance conditions occur, such as failures, leakage history, drop in flow efficiency due to internal corrosion, or substantial changes in cathodic protection requirements. ….	Recorded in the PSCS or the EDRMS	LANL	
61	851 PIPELINE MAINTENANCE	851.2 Pipeline Patrolling	Each operating company shall maintain a periodic pipeline patrol program to observe surface conditions on and adjacent to each pipeline right-of-way, indications of leaks, construction activity other than that performed by the company, natural hazards, and any other factors affecting the safety and operation of the pipeline. Patrols shall be performed at least once every year in Location Classes 1 and 2, at least once every 6 months in Location Class 3, and at least once every 3 months in Location Class 4. …	Recorded in the PSCS or the EDRMS	LANL	
62	851 PIPELINE MAINTENANCE	851.2.1 Maintenance of Cover at Road Crossings and Drainage Ditches.	The operating company shall determine by periodic surveys if the cover over the pipeline at road crossings and drainage ditches has been reduced below the requirements of the original design. If the operating company determines that the normal cover provided at the time of pipeline construction has become unacceptably reduced due to earth removal or line movement, the operating company shall provide additional protection by providing barriers, culverts, concrete pads, casing, lowering of the line, or other suitable means.	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
63	851 PIPELINE MAINTENANCE	851.2.2 Maintenance of Cover in Cross-Country Terrain.	If the operating company learns, as a result of patrolling, that the cover over the pipeline in cross country terrain does not meet the original design, it shall determine whether the cover has been reduced to an unacceptable level. If the level is unacceptable, the operating company shall provide additional protection by replacing cover, lowering the line, or other suitable means.	Recorded in the PSCS or the EDRMS	LANL	
64	851 PIPELINE MAINTENANCE	851.4 Repair Procedures for Steel Pipelines	Repair materials or equipment for which no standards or specifications are referenced in this Code shall only be permitted if qualified in accordance with para. 811.2.4. Such repairs shall be described in detail in documentation that is retained by the operating company.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL by Subcontractor	
65	851 PIPELINE MAINTENANCE	851.6 Pipeline Leak Records	Records shall be made covering all leaks discovered and repairs made. All pipeline breaks shall be reported in detail. These records along with leakage survey records, line patrol records, and other records relating to routine or unusual inspections shall be kept in the file of the operating company, as long as the section of line remains in service.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL by Subcontractor	
66	851 PIPELINE MAINTENANCE	851.7 Pipeline Markers	(c) The signs or markers shall include the words "Gas (or name of gas transported) Pipeline," the name of the operating company, and the telephone number (including area code) where the operating company can be contacted.	Signs	LANL	
67	852 DISTRIBUTION PIPING MAINTENANCE	852.2 Leakage Surveys	Each operating company having a gas distribution system shall set up in its operating and maintenance plan a provision for making periodic leakage surveys on the system.	Recorded in the PSCS or the EDRMS	LANL	
68	852 DISTRIBUTION PIPING MAINTENANCE	852.4 Requirements for Abandoning, Disconnecting, and Reinstating Distribution Facilities	Each operating company shall have a plan for abandoning inactive facilities, such as service lines, mains, control lines, equipment, and appurtenances for which there is no planned use. The plan shall also include the following provisions: … a) If the facilities are abandoned in place, they shall be physically disconnected from the piping system. … If air is used for purging, the operating company shall determine that a combustible mixture is not present after purging.	Recorded in the PSCS or the EDRMS	LANL	

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		852.4.1 Abandoning of Distribution Facilities.				
69	852 DISTRIBUTION PIPING MAINTENANCE	852.4.2 Temporarily Disconnected Service	Whenever service to a customer is temporarily discontinued, one of the following shall be complied with: (a) The valve that is closed to prevent the flow of gas to the customer shall be provided with a locking device or other means designed to prevent the opening of the valve by persons other than those authorized by the operating company. …	Recorded in the PSCS or the EDRMS	LANL	
70	852 DISTRIBUTION PIPING MAINTENANCE	852.7.4 Disturbed Pipeline Support.	When an operating company has knowledge that the support for a segment of a buried cast iron pipeline is disturbed …..	Recorded in the PSCS or the EDRMS	LANL	
71	853 MISCELLANEOUS FACILITIES MAINTENANCE 853.1 Compressor Station Maintenance	853.1.1 Compressors and Prime Movers	The starting, operating, and shutdown procedures for all gas compressor units shall be established by the operating company. The operating company shall take appropriate steps to see that the approved practices are followed.	Recorded in the PSCS or the EDRMS	LANL	
72	853 MISCELLANEOUS FACILITIES MAINTENANCE 853.1 Compressor Station Maintenance	853.1.4 Isolation of Equipment for Maintenance or Alterations.	The operating company shall establish procedures for isolation of units or sections of piping for maintenance, and for purging prior to returning units to service, and shall follow these established procedures in all cases.	Recorded in the PSCS or the EDRMS	LANL	
73	853 MISCELLANEOUS FACILITIES MAINTENANCE	853.2 Procedures for Maintaining Pipe-Type and	(a) Each operating company having a pipe-type or bottle-type holder shall prepare and place in its files a plan for the systematic, routine inspection and testing of the facilities that has the following provisions: …	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
		Bottle-Type Holders in Safe Operating Condition	(b) Each operating company, having prepared such a plan as prescribed in (a), shall follow the plan and keep records that detail the inspection and testing work done and the conditions found.			
74	853 MISCELLANEOUS FACILITIES MAINTENANCE	853.3.4 Pressure-Regulating Stations	(b) On distribution systems supplied by a single pressure- regulating station, the operating company shall determine the necessity of installing such gages in the district. In making this determination, the operating company shall take into consideration the operating conditions such as the number of customers supplied, the operating pressures, the capacity of the installation, etc.	Recorded in the PSCS or the EDRMS	LANL	
75	853 MISCELLANEOUS FACILITIES MAINTENANCE	853.4.5 Prevention of Accidental Operation.	Precautions shall be taken to prevent accidental operation of any valve covered by paras. 853.4.1 and 853.4.2. Accidental valve operation by operating company personnel and the general public should be considered in taking these precautions. Some recommended actions to be taken, where applicable, are as follows: ….	Recorded in the PSCS or the EDRMS	LANL	
76	854 LOCATION CLASS AND CHANGES IN NUMBER OF BUILDINGS INTENDED FOR HUMAN OCCUPANCY	854.1 Monitoring	(d) Following this study, if a change of Location Class is indicated, the patrols and leakage surveys shall immediately be adjusted to the intervals established by the operating company for the new Location Class.	Recorded in the PSCS or the EDRMS	LANL	
77	854 LOCATION CLASS AND CHANGES IN NUMBER OF BUILDINGS INTENDED FOR HUMAN OCCUPANCY	854.5 Concentrations of People in Location Classes 1 and 2	(b) Pipelines near places of public assembly as outlined in (a) above shall have a maximum allowable hoop stress not exceeding 50% of SMYS. Alternatively, the operating company may make the study described in para. 854.1(c) and determine that compliance with the following will result in an adequate level of safety: …. (2) Patrols and leakage surveys are conducted at intervals consistent with those established by the operating company for Location Class 3. …	Recorded in the PSCS or the EDRMS	LANL	

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78	855 PIPELINE SERVICE CONVERSIONS	855.3 Requirements for Conversion to Gas Service	(e) Make replacements, repairs, or alterations that in the operating company's judgment are advisable.	Recorded in the PSCS or the EDRMS	LANL	
79	856 ODORIZATION	856.2 Odorization Equipment	Each operating company shall use odorization equipment designed for the type and injection rate of odorant being used.	Recorded in the PSCS or the EDRMS	LANL	
80	856 ODORIZATION	856.3 Odorant Requirements	Each operating company shall use an odorant in accordance with the following requirements: …	Recorded in the PSCS or the EDRMS	LANL	
81	856 ODORIZATION	856.4 Records	For all odorizers, except small wick-type or bypasstype, or similar odorizers serving individual customers or small distribution systems, each operating company shall maintain records containing the following items: *(a)* the type of odorant introduced into the gas *(b)* the amount of odorant injected per million cubic feet (m3)	Recorded in the PSCS or the EDRMS	LANL	
82	856 ODORIZATION	856.5 Odorant Concentration Tests	Each operating company shall conduct odorant concentration tests on gas supplied through its facilities that requires odorization. …	Recorded in the PSCS or the EDRMS	LANL	
83	857 UPRATING	857.1 General	(a) A higher maximum allowable operating pressure established under this section may not exceed the design pressure of the weakest element in the segment to be uprated. It is not intended that the requirements of this Code be applied retroactively to such items as road crossings, fabricated assemblies, minimum cover, and valve spacings. Instead, the requirements for these items shall meet the criteria of the operating company before the uprating is performed.	Recorded in the PSCS or the EDRMS	LANL	
84	860 GENERAL	860.1 Scope	(c) Deviations from the provisions of this Chapter are permissible in specific situations, provided the operating company can demonstrate that the objectives expressed herein have been achieved. (d) Corrosion control requirements and procedures may, in many instances, require measures in addition to those shown in this Chapter. Each operating company shall establish procedures to implement its corrosion control program, including the requirements of this Chapter, to achieve the desired objectives. Procedures, including those for design, installation, and maintenance of cathodic	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
			protection systems, shall be prepared and implemented by, or under the direction of, persons qualified by training and/or experience in corrosion control methods. … (e) Records indicating cathodically protected piping, cathodic protection facilities, and other structures affected by or affecting the cathodic protection system shall be maintained by the operating company.			
85	867 STRESS CORROSION AND OTHER PHENOMENA	867 STRESS CORROSION AND OTHER PHENOMENA	This paragraph must be limited to general statements rather than specific limits in regard to stress corrosion. Stress corrosion is currently the subject of investigative research programs, and more specific data will certainly be available to the pipeline designer and operating company in the future. In the interim, this Code suggests that the user refer to the current state of the art. Cathodic protection current levels, quality of pipe surface preparation and coating, operating temperatures, stress levels, and soil conditions shall be considered in pipeline design and operations.	Recorded in the PSCS or the EDRMS	LANL	
B31.8 Qualifications						
86	802 SCOPE AND INTENT	802.2.6 Qualification of Those Performing Inspections.	Individuals who perform inspections shall be qualified by training and/or experience to implement the applicable requirements and recommendations of this Code.	Recorded in the PSCS or the EDRMS	LANL	
87	807 TRAINING AND QUALIFICATIO N OF PERSONNEL	807.1 Program	Each operating company shall have a program to manage the qualification of personnel who perform operating, maintenance, and construction activities that could impact the safety or integrity of a pipeline. The program shall address, at a minimum, the following elements: (a) Identify those tasks for which the qualification provisions of the program apply. The tasks shall include operating, maintenance, and construction activities that could impact the safety or integrity of a pipeline. … (c) Identify training requirements for personnel involved in performing tasks covered by the program. (d) Describe the evaluation process and criteria used to determine (1) initial qualification (2) subsequent or ongoing qualification (3) suspension or revocation of	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
			qualifications (4) reinstatement of qualifications (e) Establish organizational responsibilities for carrying out each program element. (f) Establish a process to periodically evaluate the effectiveness of the qualification program, including provisions for updating the program based on the results of effectiveness appraisals.			
88	811 QUALIFICATIO N OF MATERIALS AND EQUIPMENT	811.1 Categories	Materials and equipment fall into the following six categories pertaining to methods of qualification for use under this Code: …..	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL by Subcontractor for work done on or offsite	
89	811 QUALIFICATIO N OF MATERIALS AND EQUIPMENT	811.2 Procedures for Qualification	Prescribed procedures for qualifying each of these six categories are given in the following paragraphs.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
90	811 QUALIFICATIO N OF MATERIALS AND EQUIPMENT	811.2.1 Conformance.	811.2.1 Conformance. Items that conform to standards or specifications referenced in this Code [para. 811.1(a)] may be used for appropriate applications, as prescribed and limited by this Code without further qualification. (See section 814.)	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
91	814 MATERIAL SPECIFICATION S	814.1.4 Qualification of Plastic Piping Materials	(a) In addition to complying with the provisions of para. 814.1.3, the user shall thoroughly investigate the specific plastic pipe, tubing, or fitting to be used and shall determine material serviceability for the conditions anticipated. The selected material shall be adequately resistant to the liquids and chemical atmospheres that may be encountered. (b) When plastic pipe, tubing, or fittings of different material specifications are joined, a thorough investigation shall be made to determine that the materials are compatible with each other. See para. 842.2.9 for joining requirements.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL by Subcontractor for work done on or offsite	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
92	Chapter II Welding 821 GENERAL	821.1 Welding Processes	The welding may be done by any process or combination of processes that produce welds that meet the procedure qualification requirements of this Code. The welds may be produced by position welding or roll welding, or a combination of position and roll welding.	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	
93	Chapter II Welding 821 GENERAL	821.4 Welding Qualifications	All welding procedures and welder qualifications shall be in accordance with section 823.	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	
94	823 QUALIFICATIO N OF PROCEDURES AND WELDERS	823.1 Requirements for Qualifying Welders on Piping Systems Operating at Hoop Stresses of Less Than 20% of the Specified Minimum Yield Strength	Welders whose work is limited to piping operating at hoop stress levels of less than 20% of the specified minimum yield strength shall be qualified under any of the references given in para. 823.2.1 or in accordance with Mandatory Appendix G.	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	
95	823 QUALIFICATIO N OF	823.2 Requirements for Qualifying Procedures	Welding procedures and welders performing work for new construction and out-of-service pipelines shall be qualified under the BPV Code, Section IX or API 1104. For in-service welding, welding procedures and welders	Records of WPS and WPQ. Record of welder or weld operator	LANL for self-performed work and for work done at	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
	PROCEDURES AND WELDERS	and Welders on Piping Systems Operating at Hoop Stresses of 20% or More of the Specified Minimum Yield Strength 823.2.1 Qualifying Standards	shall be qualified under Appendix B of API 1104. Procedures qualified under Appendix B are suitable for weld deposition repair, provided the procedure is appropriate for the remaining wall thickness to which it is being applied.	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; Subcontractor for work done on or offsite	
96	823 QUALIFICATIO N OF PROCEDURES AND WELDERS	823.2.2 Compressor Station Piping.	When welders qualified under API 1104 are employed on compressor station piping, their qualification shall have been based on the destructive mechanical test requirements of API 1104.	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	
97	823 QUALIFICATIO N OF PROCEDURES AND WELDERS	823.2.3 Variables for the Separate Qualification of Welders.	The references given in para. 823.2.1 contain sections titled "Essential Variables" applicable to welder qualification. These shall be followed, except that for purposes of this Code, all carbon steels that have a carbon content not exceeding 0.32% by heat analysis and a carbon equivalent (C + 1⁄4 Mn) not exceeding 0.65% by heat analysis are considered to come under material grouping P-No. 1. Alloy steels having weldability characteristics demonstrated to be similar to these carbon steels shall be welded, preheated, and stress relieved as prescribed herein for such carbon steel. There may be significant differences in the base metal strength encompassed by these P-No. 1 materials, and although it is not an essential variable to welder	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	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
			qualification, it may require separate procedure qualification in accordance with para. 823.2.1.			
98	823 QUALIFICATIO N OF PROCEDURES AND WELDERS	823.3 Welder Requalification Requirements	Welder requalification tests shall be required if there is some specific reason to question a welder's ability or if the welder is not engaged in a given process of welding for 6 months or more. All welders shall be requalified at least once each year.	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	
99	823 QUALIFICATIO N OF PROCEDURES AND WELDERS	823.4 Qualification Records	Records of the tests that establish the qualification of a welding procedure shall be maintained as long as that procedure is in use. The operating company or contractor shall, during the construction involved, maintain a record of the welders qualified, showing the dates and results of tests.	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	
100	841 STEEL PIPE	841.1.9 Additional Design Information or Instructions	(j) Pipeline Installation by Directional Drilling (1) Qualifications. Drilling contractors shall maintain written design and installation procedures addressing crossings to be completed by the directional drilling method. Drilling equipment operators and personnel responsible for establishing the location of the pilot head and reamer during drilling operations shall be qualified by training and experience in the implementation of the contractor's procedures.	Recorded in the PSCS or the EDRMS	LANL for self-performed work and for work done at LANL; Subcontractor for work done on or offsite	
101	845 CONTROL AND LIMITING OF GAS PRESSURE	845.2.3 Qualification of a Steel Pipeline or Main to	(a) Pipeline Operating at 100 psig (690 kPa) or More. This paragraph applies to existing natural gas pipelines or to existing pipelines being converted to natural gas service where one or more factors of the steel pipe design formula (see para. 841.1.1) is unknown, and the	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.8 Code Heading	B31.8 Code Reference	Code Text	How	Who	Applc. to System? (Y/N)
		Establish the MAOP	pipeline is to be operated at 100 psig (690 kPa) or more. The maximum allowable operating pressure shall be determined by hydrostatic testing of the pipeline. …			
102	850 OPERATING AND MAINTENANCE PROCEDURES AFFECTING THE SAFETY OF GAS TRANSMISSION AND DISTRIBUTION FACILITIES	850.2 Basic Requirements	(e) provide training for employees in procedures established for their operating and maintenance functions that is comprehensive and designed to prepare employees for service in their area of responsibility. See section 807 for guidance on the training and qualification of personnel performing tasks that could impact the safety or integrity of a pipeline.	Recorded in the PSCS or the EDRMS	LANL	
103	855 PIPELINE SERVICE CONVERSIONS	855.1 General	The intent of this section is to provide requirements to allow an operator of a steel pipeline previously used for service not covered by this Code to qualify that pipeline for service under this Code. For a dual service pipeline used alternately to transport liquids in conformance with an appropriate Code, such as ASME B31.4, and gas under this Code, only the initial conversion to gas service requires qualification testing.	Recorded in the PSCS or the EDRMS	LANL	

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No.	B31.9 Code Heading	B31.9 Code Reference	Code Text	How	Who	Applic. to System? (Y/N)
B31.9-2017 Mandatory Minimum Documentation Requirements						
1	927 Welded Fabrication of Metals	927.6.4 Qualification Records	The employer shall maintain copies of the procedure and performance qualification records specified by ASME BPV Code, Section IX that shall be available to the owner or the owner's agent	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	
2	936 Inspection and Examination	936.3 Responsibility for Examination	Inspection does not relieve the manufacturer, fabricator, or erector of responsibility for performing all required examinations and preparing suitable records for the owner's use.	Examination Record showing evaluation to acceptance criteria 936.6.1 Girth Welds and Groove Welds. Limitations on imperfections are as follows: (a) Cracks. None permitted. (b) Lack of Fusion. The length of unfused areas shall not be more than 20% of the circumference of the pipe, or of the total length of the weld, and not more than 25% in any 6 in. (152 mm) of weld. (c) Incomplete Penetration. The total joint penetration shall not be less than the thickness of the thinner of the components being joined, except that incomplete root penetration is acceptable if it does not exceed the lesser of 1⁄32 in. (1 mm) or 20% of the required thickness, and its extent is not more than 25% in any 6 in. (152 mm) of weld. (d) Undercut and Reinforcement. Undercut shall not exceed the lesser of 1⁄32 in. (1 mm) *(e) Concave Root.* Concavity of the root surface shall not reduce the total thickness of the joint, including reinforcement, to less than the thickness of the thinner of the components being joined. *(f) Excess Root Penetration.* The excess shall not exceed the lesser of 1⁄8 in. (3.2 mm) or 5% of the inside diameter of the pipe. *(g) Weld Surfaces.* There shall be no overlaps or abrupt ridges and valleys.or 121⁄2% of wall thickness. Thickness of weld reinforcement shall not exceed 3⁄16 in. (4.8 mm).	Subcontractor or LANL if self-performed	

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No.	B31.9 Code Heading	B31.9 Code Reference	Code Text	How	Who	Applicable to System? (Y/N)
B31.9-2017 Owner Approval						
3	900 GENERAL		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 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	
4	922 Design Requirements Pertaining to Specific Piping Systems . .	922.3.2 Joints	(a) Threaded, welded, brazed, or flared joints shall be used within buildings. A pipe thread compound suitable for oil shall be used on threaded joints. Joints relying on friction or a combustible material shall not be used. Brazing or flare fittings shall be wrought. Flanged or grooved joints may be used with a gasket material meeting the requirements of API 607 or another standard acceptable to the owner.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
5	927 Welded Fabrication of Metals	927.6.2 Procedure Qualification by Others	In order to avoid duplication of effort and subject to the approval of the owner, WPSs qualified by a technically competent group or agency may be used, the following are met: (a) The WPSs meet the requirements of ASME BPV Code, Section IX and any additional qualification requirements of this Code. (b) The employer has qualified at least one welder or welding operator following each WPS. (c) The employer's business name shall be shown on each WPS and on each qualification record. In addition, qualification records shall be signed and dated by the employer, thereby accepting responsibility for the qualifications performed by others.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
6	927 Welded Fabrication of Metals	927.6.3 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 or welding operator made by a previous employer.	For work done by LANL or on LANL property Variance/Alternative Method Form 2137 as Alternative Method	For work done by LANL or on LANL property LANL Owner approved, COE website storage	

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No.	B31.9 Code Heading	B31.9 Code Reference	Code Text	How	Who	Applicable to System? (Y/N)
7	936 Inspection and Examination	936.5 Type and Extent of Required Examination	Unless otherwise specified in the engineering design, the type of examination shall be visual examination in accordance with the method in para. 936.4.1. If the degree of examination and inspection or the basis for rejection is to be more rigorous than required by this Code, it shall be a matter of prior agreement between the fabricator or installer and the purchaser.	Variance/Alternative Method Form 2137 as Alternative Method	LANL Owner approved, COE website storage	
No.	**B31.9 Code Heading**	**B31.9 Code Reference**	**Code Text**	**How**	**Who**	**Applicable to System? (Y/N)**
B31.9-2017 Qualifications						
8	927 Welded Fabrication of Metals	927.6.4 Qualification Records.	The employer shall maintain copies of the procedure and performance qualification records specified by ASME BPV Code, Section IX that shall be available to the owner or the owner's agent	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	