Appendix 5B

Compliance Checklist of Longhorn's Procedures Against API Recommended Practice 1129, Assurance of Hazardous Liquid Pipeline System Integrity, First Edition, 1996

Table 5B-1. Comparison of Compliance with API Recommended Practice 1129Assurance of Hazardous Liquid Pipeline System Integrity, First Edition, 1996

Section	Topic	Issue/Details	Compliance	Comments
Section 1	*General*	This recommended practice is a basic guide and information resource for activities to assist in providing increased assurance of a pipeline system's integrity.	n/a	
Section 2	*Design and Construction for Integrity Assurance*			
2.1	General	Assurance of pipeline integrity begins with design and construction practices.	n/a	Background information
2.2	Codes	Assuring pipeline integrity involves using design and construction codes.	n/a	Background information
2.3	Specifications	Development and utilization of specifications should be used to provide detailed requirements.	n/a	Background information
2.4	Pipeline route selection and environmental protection	Pipeline routing should be based on a formalized risk assessment/management technique.	Will meet	Being implemented in mitigation measures
2.5	Construction contractor/supplier considerations	An evaluation should be carried out to assure quality and capability prior to the selection and engagement of contractors, suppliers, and other resources.	n/a	Design and construction issue
2.6	Inspection	Inspections are required to ensure pipeline systems are installed in accordance with certain requirements and procedures.	n/a	Since the focus of this review is on operational procedures, a compliance check of construction inspections is beyond the scope of this effort.
2.7	Records and documentation	A complete record of construction data should be maintained.	n/a	Background information
	Girth welds and nondestructive test results		Meets	Welding Manual
	Amount, location, cover of each pipe size installed		Meets	As builts, OP-19.10 to -19.13
	Location of pipeline crossings		Meets	As builts, OP-19.10 to -19.14
	Locations of buried utility crossings		Meets	As builts, OP-19.10 to -19.15
	Locations of overhead crossings		Meets	As builts, OP-19.10 to -19.16
	Locations of valves and corrosion test stations		Meets	As builts, OP-19.10 to -19.17
	Pipe mill certificates		Meets	WPL 100-2, WPL 101-1

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Section	Topic	Issue/Details	Compliance	Comments
	Land survey records		Meets	Business records
	Corrosion control facilities records		Meets	CP system reports
	Coating material records		Meets	Construction records
	Application information		Meets	Permit records
	Hydrostatic test results		Meets	Welding Manual, Scope, 3.4; MCOJT 3.02, O2-ENG-1010
	Welder qualification records		Meets	Welding 102
	Inspector qualifications		Meets	
	Construction drawings		Meets	Design and construction issue
Section 3	*System Monitoring and Control*			
3.1	General	The pipeline controller must be able to operate the pipeline system within acceptable limits during normal and abnormal conditions.	n/a	Background information
3.2	Controls	Knowledge of valves, actuators, pressure control devices, communication systems, and SCADA systems is required for design of controls.	Will meet	SCADA
3.3	Leak detection	Pipeline companies use a number of procedures and methods to detect the movement of products in their pipelines	Will meet	SCADA
3.3.1	Computational pipeline monitoring - SCADA system		Will meet	SCADA
3.3.2	Station/terminal sensors		Will meet	SCADA
3.3.3	Monitoring of pipeline conditions by pipeline controllers	Pipeline monitoring and trending for operation and failure	Will meet	SCADA
3.4	Training and testing	Pipeline operators should establish training standards for design and operational safety.	Meets	OOJT, MCOJT
Section 4	*Corrosion Control*			
4.1	Corrosion control design of new pipelines	Corrosion protection within one year of construction. DOT 49 CFR Part 195, NACE RP0169		OP-6.53 to -6.59, -15.1 to -15.6, NACE - OP-6.26, design and construction issue.
4.1.2	Monitoring	Test stations installed during construction. NACE RP 01 69 4.5.		OP-6.54, -19.5, NACE not addressed/design and construction issue

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Section	Topic	Issue/Details	Compliance	Comments
4.1.4	Coating systems	External coating required. NACE RP0169 5,6.3.1; DOT 49 CFR § 195.238. Internal corrosion control per NACE RP 01 75.	Meets	OP-6.53 to -6.59, -15.1 to -15.16, design and construction issue
4.2	Coatings and linings		n/a	Background information
4.2.1	Coating selection	Factors and concerns for coating selection	Meets	OP-6.55
4.2.2	Coating system evaluations	Evaluations of the coating systems on all structures should be conducted periodically	Meets	OP-6.55
4.3	Routine external corrosion control		n/a	Background information
4.3.1	Monitoring:	CP levels must be monitored annually	n/a	Background information
	Power sources	During annual survey, tests should be performed on these components.	Meets	OP-6.54, CBT Module #20
	Cased pipe		Meets	OP-6.57
	Isolation flanges			
	Pipe-to-soil potentials		Meets	MCOJT 2.03, OP-6.53 to –6.58, -19.6
	Additional monitoring:	Periodic monitoring of condition should be conducted on these components.	n/a	Background information
	Above ground piping		Meets	OP-6.58, MCOJT 2.14
	Valves		Meets	OP-19.7, MCOJT 2.05, O2-OPR-1035
	Meter stations			
	Tankage		Meets	OPOJT 6.21, O2-FAC-1009
4.3.2	Rectifier inspection	Rectifiers inspected once every two months, six times a year	Meets	OP-6.54, CBT Module #20, OP-19.6
4.3.3	Other inspections	Electrical inspection of all bare pipe without cathodic protection, net protective current criterion. Once every five years.	Meets	MCOJT 2.14, OP-6.58, OP-19.6
	Leak record review	Per 49 CFR 195.416(d)	Meets	OP-6.26, OP-19.5
	Maintenance of cathodic protection system	Per NACE RP 0169 10	Meets	OP-6.26
	Monitor electrically-shorted cased pipe	Monitor per company procedures	Meets	OP-6.57
	Inspect unearthed buried pipe	Inspection to include coating condition, metallic pipe surface condition if exposed and internal conditions if cut.	Meets	OP-6.58
	Out of tolerance corroded piping replaced or repaired or operating pressure reduced	Per 49 CFR 195.416.	Meets	MCOJT 2.11, CBT Module LQ 18, LQ33

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Section	Topic	Issue/Details	Compliance	Comments
	Measurement of pipe-to-soil potentials	Including continuous current, interrupted current, cell-to-cell potential.	Meets	OP-6.53, -6.54
4.3.4	Close interval survey (CIS)	Test frequency based on sound engineering judgement.	Meets	OP-6.54
4.4	Routine internal corrosion monitoring and control methods	Weight loss coupons inspected twice per year with chemical inhibitor use, 49 CFR 195.418	Meets	OP-6.58
	Test methods	Internal corrosion monitoring methods include the following:	n/a	Background information
	Probes	Electrical, galvanic and/or hydrogen probes	n/a	Addressed by reference to NACE requirements and in contractor terms.
	Visual inspections		Meets	OP-6.58, OP-19.6
	Test spools		n/a	Explicit reference discussion not found. Design and construction issue
	Ultrasonic wall thickness measurements		Will meet	Being addressed in mitigation measures.
	Ultrasonic, magnetic flux leakage internal inspections		Meets	Addressed in ILI contracts and being addressed in mitigation measures
	Radiography			Design and construction issue
	Water chemistry tests	Including iron concentration, manganese concentration, pH, bacterial levels, oxygen levels, CO_2, H_2S, Cl, SO_4, and inhibitor residual	n/a	
Section 5	*Inspection and Review*			
5.1.1	Regulatory Requirements		n/a	Background information
	195.412	Inspection of ROW and crossings under navigable waters	Meets	OP-6.22 to -6.25, -6.48 to -6.52, -19.5; MCOJT 2.16
	195.414	Corrosion control	Meets	OP-6.51 to -6.57, -15.1 to -15.16
	195.416*	External corrosion control	Meets	OP-6.51 to -6.57, -19.5
	195.418*	Internal corrosion control	Meets	OP-6.58, -19.6
	195.42	Valve maintenance	Meets	OP-19.7, MCOJT 2.05
	195.428	Overpressure safety devices	Meets	OP-19.8, MC-5.8
	195.432	Breakout tanks	Meets	OP-19.9, OOJT 6.21
5.2	Risk assessment		Meets	Has been practiced and incorporated into proposed mitigation measures and LIMS

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Section	Topic	Issue/Details	Compliance	Comments
5.2.1	Analysis	Includes elements of third-party damage review, corrosion, operating errors, manufacturing defects, and design/construction flaws	Meets	Mitigation plans
5.2.1.1	Consequences	Includes public and personnel health and safety, environmental damage, and property and/or asset losses	Meets	Mitigation plans
5.2.2	Results	Identifying high risk areas	Meets	Mitigation plan
5.3	Hydrostatic testing		n/a	Background information
5.3.1	General	Per 49 CFR 195 Subpart E	Meets	OP-6.42, MCOJT 3.02
5.3.2	Effectiveness	Operators should evaluate each pipeline segment and/or components with respect to potential defect behavior.	Meets	Mitigation plans
5.3.3	Hydrostatic Testing Programs	Formalized program should be developed	Meets	Mitigation plans
5.3.4	Implementation	Testing schedule should be developed	Meets	Mitigation plans
5.4	Internal inspection		n/a	Background information
5.4.2	Anomaly characterization	Assessment plan used to plan and prioritize pipe repair/replacement; coating repair, debris removal in bedding or backfill	Meets	Mitigation plan
5.4.3	Frequency of inspection or inspection planning	Based on sound engineering judgement	Meets	Mitigation plan
5.4.3.1	Group failure issues	Include, pipeline age, cathodic protection levels, pipeline condition, coating condition and type, leak history, MIC, soil type, soil stress, and population densities	Meets	Mitigation plan
5.4.3.2	Consequence issues	Include location and use of public buildings, environmental considerations, and products transported	Meets	Mitigation plan
5.4.4	In-line inspection capabilities		n/a	Background information
	External and internal metal loss	Magnetic flux leakage technology or ultrasonic pulse-echo technology	Will meet	
	Geometric anomalies including dents	Mechanical calipers or sonar	Will meet	
5.4.5	Limitations	Consider factors effecting the accommo-dation of internal inspection devices	Meets	Pipeline has been pigged previously

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Section	Topic	Issue/Details	Compliance	Comments
5.4.6	Operating considerations	Consider potential alterations to normal pipeline operations	Meets	Operational Control Procedures Mitigation Plan – Management of Change
5.4.7	Correlation of in-line inspection and close interval surveys	CIS and internal inspection for pipeline corrosion control	Will meet	OP-6.53 to -6.58
5.5	Tank Integrity - Referenced API Standards		n/a	Background information
	API RP 651	Cathodic protection of above ground petroleum storage tanks	Meets	Design and construction issue
	API RP 652	Lining of above ground petroleum storage tank bottoms	Meets	Design and construction issue
	API RP 653	Tank inspection, repair, alteration, and reconstruction	Meets	WPL 102 and WPL 104
	API Std 2510	Design and construction of LPG installations	n/a	Does not apply
	API Std 2610	Design, construction, operation, maintenance and inspection of terminal and tank facilities	Meets	OP-9, Operators On-The Job Training Manual, Preventative maintenance Manual, Operations Control Procedures, Safety manual
5.6	Other reviews and analyses		n/a	Background information
5.6.1	Reviews		n/a	Background information
	49 CFR 195.402	Maintenance and operating manuals and emergency response	Meets	OP-19.2
	49 CFR 195.402	Training	Meets	OP-18.1
5.6.2	Audits	Regulatory and internal compliance audits	Meets	Mitigation plan
5.6.2.1	Documentation requirements	Up-to-date documentation, completed and maintained		Expected to be covered within mitigation plan
		System for filing and retrieval		Expected to be covered within mitigation plan
		Personnel training for proper use		Expected to be covered within mitigation plan
		Match documentation and practice		Expected to be covered within mitigation plan
		Timely corrective action on discovered deficiencies		Expected to be covered within mitigation plan

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Section	Topic	Issue/Details	Compliance	Comments
5.6.2.2	Audit requirements	Process used to improve performance		Expected to be covered within mitigation plan
		Assess overall effectiveness of compliance processes		Expected to be covered within mitigation plan
		Constructive feedback at action level with follow-up to ensure corrective action is taken.		Expected to be covered within mitigation plan
		Combine other compliance audits e.g., EH&S to improve efficiency of audit process		Expected to be covered within mitigation plan
5.6.3	Failure analysis	Metallurgical examination of pipe, flange, bolting, fitting, or weld deterioration or failure.	Meets	Conducted when needed. See report on 1998 Houston accident.
		Metallurgical/electrical examination of unexplained machinery failure	Meets	Expected to be “conducted when needed”
		Other laboratory analyses or examination of various failures	Meets	Expected to be addressed when needed

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
Chapter I	*Scope and Definitions*	This Code prescribes requirements for the design, materials, construction, assembly, inspection, and testing of piping	n/a	Background information
Chapter II	*Design*	Defines pressures, temperatures, and various forces applicable to the design of piping systems.	n/a	Design and construction issue
Chapter III	*Materials*	Prescribes acceptable materials and specifications	n/a	Design and construction issue
Chapter IV	*Dimensional Requirements*	Dimensional requirements for standard and nonstandard piping components	n/a	Design and construction issue
Chapter V	*Construction, Welding, and Assembly*	This section contains requirements for new construction and replacement of existing systems	n/a	Design and construction issue
434.6	Ditching		n/a	Background information
434.6(a)	Depth of cover	Specifies minimum depth of cover (same table as195.248) or where minimum cover cannot be achieved, additional protection from external forces must be provided.	Meets	OP-6.13 (12"), MCOJT 2.15 (18"), MCOJT 2.09
434.6(b)	Underground structures	Location of underground structures shall be determined in advance. Minimum 12 inch clearance.	Meets	MCOJT 2.15
434.8	Welding	Incorporates requirements of API 1104	Meets	William's Welding Manual
434.12	Restoration of Right of Way and Cleanup	Shall follow good construction practices and considerations of private and public safety.	Meets	MCJOT 2.16
434.18	Line Markers	Requires adequate markers indicating caution for the protection of the pipeline and people. No frequency specified. References API RP 1109.	Meets	MCJOT 2.08
Chapter VI	*Inspection and Testing*			
436	Inspection	Construction inspection provisions for material, construction, welding, assembly, and testing.	n/a	Since the focus of our review is on operational procedures, a compliance check on this section is beyond the scope of this effort.
437	Testing	Testing required for new construction. Should leaks occur, the line section shall be repaired or replaced and retested.	Meets	OC -5,OP-6.41 to 6.46, API RP-1110 referenced, MCOJT 302, 159 PPTP

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Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
437.1	Testing required for fabricated components and after new construction	Per 437.4	n/a	Background information
437.4	Testing pressure		n/a	Background information
437.4.1	Hydrotesting of Internal Pressure Piping		n/a	Background information
437.4.1(a)	Hydrotest of 1.25 times internal design pressure for not less than four hours for piping operated at hoop stress of more than 20% of specified minimum yield strength	A leak test is not required for portions which have passed a visual inspection. A leak test is required for portions which have not had a visual inspection. Leak test to be held at 1.1 times internal design pressure for no less than 4 hours.	Meets	Company Pipeline Pressure Testing Procedure (159 PPTP), OP-6.42, MCOJT 3.02
437.4.1(b)	API RP 1110 may be used as a basis of hydrotest		Meets	OP-6.43, MCOJT 3.02
437.4.1(c)	Hydrotest to be conducted with water with exceptions: pipeline not offshore; outside of cities and other populated areas; and each building within 300 ft unoccupied during test with hoop stress of 50% or more of specified yield strength.	Also requires that test section kept under surveillance by regular patrols during test and communication maintained along test section.	Meets	OP-6.43
437.4.1(d)	Provisions made for pressure relief during testing subject to thermal expansion. Temperature change effects accounted for in test results		Meets	MCOJT 3,02
437.4.1(e)	Water drained in cold weather after test to avoid freeze damage		Meets	OP-6.43
437.4.3	Leak Test - 1 hour hydrostatic or leak test used for piping systems operated at hoop stress of 20% of specified yield strength.	Test at 1.25 times design pressure	Meets	OP-6.43
437.6	Qualification Tests		n/a	Background information
437.6.1	Visual Examination	Per 436.5.1	Meets	William's Welding M annual
437.6.2	Bending Properties	Required for pipe of unknown specification or ASTM A 120 if minimum yield strength for design is above 24,000	n/a	A design/construction issue
437.6.3	Determination of Wall Thickness	Measure thickness at quarter points. Use next nominal wall thickness below average measurement.	Meets	OP-6.29 to 6.33, WPL 101 6.2, WPL U-2

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Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
437.6.4	Determination of Weld Joint Factor	For unknown weld joints, joint factor shall not exceed 0.6 for NPS 4 or smaller or 0.8 for > NPS 4	n/a	Design and construction issue
437.6.5	Weldability	Specifications for determining weldability of steel pipe with unknown specifications.	Meets	WPL-101-8.3
437.6.6	Determination of Yield Strength	Establish tensile properties by API 5L or 5LU	Meets	William's Welding Manual, MCOJT 3.02
437.6.7	Minimum Yield Strength Value	Lesser of: (a) 80% of average yield strength tests; (b) minimum value of any yield strength test < 52,000; (c) 24,000 if average yield-to-tensile ratio exceeds 0.85	Meets	MCOJT 3.02
437.7	Records			
	Records for design, construction, and testing of each mainline.	Records to include specs, route maps, alignments, as-builts, locations, coatings, test data	Meets	OP-19.10 to 19.13
Chapter VIII	*Operation and Maintenance Procedures*			
450	Operation and Maintenance Procedures Affecting the Safety of Liquid Transportation Piping Systems		n/a	Background information
450.1	General		n/a	Background information
450.1(a)	Procedures based on code provisions and company's knowledge and experience of its conditions and safe operating conditions		Meets	Williams System of Operating Manuals
450.1(b)	Code serves as a general guide, company to operate prudently accounting for current circumstances		Meets	Williams System of Operating Manuals
450.1(c)	Recognition of local conditions on maintenance and repair		Meets	Williams System of Operating Manuals
450.2	Operation and Maintenance Plans and Procedures		n/a	Background information
450.2(a)	Written detailed plans and training procedures for operations and maintenance for piping systems		Meets	Williams System of Operating Manuals

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
450.2(b)	Plan for external and internal corrosion control of new and existing piping systems	Include requirements per 453 and Chapter VIII	Meets	OP-6.22 to -6.25, MCOJT 2.04
450.2(c)	Written emergency plan, training of operators, and liaison with local officials	Per 453	Meets	Emergency Response Plan
450.2(d)	Have plan for reviewing changes in conditions affecting integrity and safety of piping system	Include provisions for patrolling and reporting construction activities and changes in conditions	Meets	OP-6.22 to 6.25, MCOJT 2.04
450.2(e)	Establish liaison with local authorities to prevent accidents with excavators		Meets	MCOJT 2.17, 2.18
450.2(f)	Establish procedures to analyze failures and accidents to determine cause and minimize recurrence		Meets	OP-20.1 to 20.12
450.2(g)	Maintain maps and records to administer plans and procedures		Meets	OP-19.10 to 19.13
450.2(h)	Procedures for abandoning piping systems in place		Meets	OP 6.14
450.2(i)	Establish plans and procedures based on greatest hazard to public, construction, or extraordinary maintenance requests		Will meet	Prioritization of hazards to establish "greatest" hazards addressed in monitoring plan
450.2(j)	Operate and maintain system in accordance with plans and procedures		Meets	Operating Procedures Manual
450.2(k)	Modify plans and procedures periodically based on experience, system exposure to public, and changes in operating conditions		Meets	Operating Procedures Manual Introduction
451	Pipeline operation and Maintenance		n/a	Background information
451.1	Operating Pressure		n/a	Background information
451.1(a)	Maximum steady state pressure and static head pressure not to exceed rated design pressure, pressure surges not to exceed design pressure by more than 10%		Meets	OC 2.10, OC 3.1; Welding, Scope and Definitions 2.4, 3.4; MCOJT 3.02
451.1(b)	Piping system qualified with hoop stress greater than 20% of minimum yield strength in accordance with 456		Meets	OC 5.1, MCOJT 3.02

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Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
451.1(c)	Piping derated to lower operating pressure in lieu of repair or replacement shall operate at maximum steady state pressure in 451.7		Meets	OP-6.28
451.1(d)	For materials constructed under superceded codes and standards, design pressures to be determined using codes and standards in effect at time of construction		Meets	Design and construction issue
451.2	Communications	A communications facility shall be maintained	Meets	SCADA
451.3	Markers	Requires markers to locate and identify the system. No frequency specified. Markers shall be maintained. References API RP 1109.	Meets	Pipe Marker Standard in Operating Manual missing, MCOJT 2.11
451.4	Right of Way Maintenance	Shall be maintained to provide clear visibility and reasonable access.	Meets	MCOJT 2.11
451.5	Patrolling	Patrols shall be made at intervals not exceeding 2 weeks. Underwater crossings inspected periodically and when in danger from floods, storms or suspected mechanical damage.	Meets	MCOJT 2.03, OP-6.22, -6.48 to -6.52
451.6	Pipeline Repairs		n/a	Background information
451.6.1	Repairs shall be covered by a maintenance plan per 450.2	References API Publ. 2200, 2201; API RP 1107, 1111.	Meets	MCOJT 2.11, OP-6.28 to -6.33, WPL 101
451.6.2	Disposition of Defects		n/a	Background information
451.6.2(a)	Limits and Dispositions of Imperfections	Specifies which imperfections must be repaired or replaced	Meets	OP-6.28 to 6.33, WPL 101 4.0
451.6.2(b)	Allowable Pipeline Repairs	Specifies types of repairs when not practical to take pipe out of service	Meets	OP-6.29
451.6.2(c)	Repair methods	Specifies acceptable repair techniques	Meets	OP-6.34 to 6.41
451.6.3	Testing Repairs to Pipelines Operating at a Hoop Stress of More than 20% of the Specified Minimum Yield Strength of the Pipe	Requires pressure test for pipe replacements and examination of repair welds.	Meets	OP-6.42 to 6.47
451.7	Derating a Pipeline to a Lower Operating Pressure		Meets	OP-6.28
451.8	Valve Maintenance	Block valves to be inspected, serviced, and partially operated at least annually.	Meets	OP-19.7, MCOJT 2.05, Form 02-OPR-1035
451.9	Railroads and Highways Crossing Existing	Reanalyze pipeline in terms of anticipated	Will meet	Mitigation plan

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Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
	Pipelines	external loads		
452	Pump station, terminal, and tank farm operation and maintenance		n/a	Background information
452.1	General	Requires procedures for start-up, operating, and shut-down. Requires periodic measurements and monitoring to detect deviations in operating conditions.	Meets	OP-4.1, 4.2, -7.1 to -7.7; Preventative Maintenance Manual; Maintenance and Calibration Manual; Operator OJT Manual
452.2	Controls and protective equipment	Pressure limiting devices, regulators, controllers, relief valves, and other safety devices	Meets	OP-7.8, -7.9-19.8; MC-5.8; O2-FAC-1010
452.3	Storage vessels	Maintain records and periodically inspect	Meets	OP-19.9, OOJT 6.21, O2-FAC-1009
452.4	Storage of combustible materials	Store in separate structure	Meets	SA-8.7 to 8.10
452.5	Fencing	Stations, terminals, and tank farms shall be fenced and locked or attended.	Meets	MCOJT-3.08, SA-2.13, OOJT 2.14
452.6	Signs		Meets	MCOJT-3.08, OP-10.2 to -10.5; SA 2.1 to 2.11
452.7	Prevention of accidental ignition		Meets	SA-8.6 and 8.6
453	Corrosion control	Per Chapter VIII	Meets	OP-6.51 to 6.75, -15.1 to -15.10; MCOJT 2.14
454	Emergency plan		Meets	Emergency Response Plan
454(a)	Written emergency plan implemented for system failures, accidents, and emergencies.	Include procedures for remedial action for safety of public and operating personnel, minimizing property damage, environmental protection, limiting discharge from pipeline.	Meets	Emergency Response Plan
454(b)	Plan for training personnel on execution in emergency situations.	Scheduled reviews every six months.	Meets	Emergency Response Plan
454(c)	Plan for coordinated communications with local civil authorities.		Meets	Emergency Response Plan
454(d)	Line of communications with residents along pipeline.		Meets	Emergency Response Plan
454(e)	Emergency response plan o include the following information:		Meets	Emergency Response Plan
454(e)(1)	Cooperative pipeline leak notification emergency action system between operating companies having pipelines in area		Meets	Emergency Response Plan

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
454(e)(2)	Reduction of pipeline pressure by termination of pumping operations, draining pipeline on either side of leak		Meets	Emergency Response Plan
454(e)(3)	Interim instructions to local authorities prior to arrival of qualified company operating personnel on site		Meets	Emergency Response Plan
454(e)(4)	Rapid transport of company personnel to site		Meets	Emergency Response Plan
454(e)(5)	Public evacuation		Meets	Emergency Response Plan
455	Records		n/a	Background information
455(a)	Operational data		Meets	Operating Manual
455(b)	Pipeline patrol records		Meets	OP-6.22 to 6.25
455(c)	Corrosions records		Meets	OP-6.58, O2-OPR-1575, O2-OPR-1509
455(d)	Leak and break records		Meets	OP-20.5
455(e)	Routine or unusual inspections		Meets	OP-6.23,6.24
455(f)	Pipeline repair records		Meets	Operating Manual
456	Qualifying a piping system for a higher operating pressure	Investigative and corrective measures required for uprating to > 20% SMYS	Meets	OP-6.42
457	Abandoning a piping system		Meets	OP-6.14
Chapter VIII	*Corrosion Control*			
460	General		n/a	Background information
460(a)	Minimum requirements for external and internal corrosion control		Meets	OP-6.53 to 6.59, -15.1 to -15.6
460(b)	Application to accommodate local conditions		Meets	OP-6.53 to 6.59, -15.1 to -15.7
460(c)	Established and written procedures to be developed and implemented under the control of trained and qualified personnel in corrosion control.	References NACE RP-01-69 and RP-06-75	Meets	OP-6.53 to 6.59, -15.1 to -15.8; MC-7.19; NACE RP-06-75 not addressed
460(d)	Corrosion personnel to be provided with proper equipment and instrumentation		Meets	OP-6.53 to 6.59, -15.1 to -15.9
460(e)	Coating crews and inspectors to be suitably trained and equipped		Will meet	Mitigation plan
461	External corrosion control for buried or submerged pipelines		n/a	Background information

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
461.1	New installations		Meets	OP-6.53 to 6.59
461.1.1(a)	Control of external corrosion of new buried piping to be provided except where non-corrosive conditions are shown to exist		Meets	OP-6.53 to 6.59
461.1.1(b)	Control of external corrosion to include protective coating with cathodic protection		Meets	OP-6.53 to 6.59
461.1.2	Protective coating		n/a	Background information
461.1.2(a)	Protective coatings to mitigate corrosion, have sufficient adhesion, be ductile to resist cracking, sufficient strength to resist damage in handling and soil stress, properties compatible with cathodic protection		Meets	OP-6.55
461.1.2(b)	Weld protrusions to be removed		Meets	WPL 100, WPL 101
461.1.2(c)	Coating to be visually inspected and holiday detected		Meets	OP-6.55
461.1.2(d)	Insulating type coatings to have low moisture absorption and high electrical resistance		Meets	OP-6.55, -6.56
461.1.2(e-g)	Piping to be carefully handled, installed, and backfilled to minimize damage to coatings		Meets	OP-6.55, -6.56
461.1.2(h)	Coating applied to attachments			Not addressed
461.1.3	Cathodic Protection Systems		n/a	Background information
461.1.3(a)	Cathodic protections system by galvanic anode or impressed current anode system required		Meets	OP-6.53, MC 7.15-7.18
461.1.3(b)	System to be installed no later than one year after completion of construction			Design and construction issue
461.1.3(c)	Control system to not damage coating, pipe, or components		Meets	OP-6.57
461.1.3(d)	Owners of underground structures which may be affected by cathodic protection system to be notified			Design and construction issue
461.1.4	Electrical isolation	References NACE RP-01-77	Will meet	Mitigation plan
461.1.5	Test leads		Meets	OP-6.54, MC 7.15-7.18
461.1.6	Electrical interference	References NACE RP-01-69 and RP-01-77	Will meet	Mitigation plan

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
461.2	Existing piping systems	Procedures to be established for determining external condition of piping	Meets	OP-6.58, O2-OPR-1575, O2-OPR-1581
461.2(a)	Examine records from previous inspections		Meets	O2-OPR-1575,1581
461.2(b)	Install cathodic protection on all buried, coated piping.		Meets	OP 6.54, all piping will be cathodically protected
461.2(c)	Operation pressures increased only upon passing of electrical inspection		Will meet	Mitigation plan
461.3	Monitoring		n/a	Background information
461.3(a)	Cathodic protection facilities to be maintained in serviceable condition	Inspections conducted every 15 months	Meets	OP-6.54, CBT Module #20
461.3(b)	Testing of cathodic protection per NACE RP-01-69 Section 6 or NACE RP-06-75, Section 5		Meets	WPC Operating Manual cites NACE RP-01-69. NACE RP-06-75 is not addressed, but this RP applies to offshore pipelines
461.3(c)	Testing schedule to be developed based on specific conditions	Age and condition of pipe, corrosiveness of environment, probability of loss of protection, method of cathodic protection, and safety		Is being developed in mitigation procedures.
462	Internal corrosion control		n/a	Background information
462.1	New installations	References NACE RP-01-75	Meets	OJT-5.31, 15.3
462.2	Existing piping systems	Requires procedures for determining corrosivity and internal condition	Meets	OP-6.58
462.3	Monitoring		Meets	OP-6.58, -15.3
462.3(a)	Examine coupons or other monitoring techniques	Intervals not exceeding 6 months	Meets	OP-6.58
462.3(b)	Visual inspection when pipe is opened		Meets	OP-6.56
463	External corrosion control for piping exposed to atmosphere		n/a	Background information
463.1	New installations	Constructed of corrosion resistant steel or applied with protective coating or paint	Meets	MC-7.19
463.2	Existing piping systems	Inspected in accordance with planned schedule and corrective actions taken	Meets	OP-6.22 to -6.25, -6.56
463.3	Monitoring	Paint or coating maintained in serviceable condition with frequency of inspections not to exceed 3 years	Meets	OP-6.58
464	Corrective measures		n/a	Background information

Table 5B-2. Comparison of Longhorn Procedures with ASME B31.4 - 1992 Edition/1994 Revisions Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols

Section	Topic	Issue/Details	Compliance	Comment/ Referenced Section
464(a)	Criteria on corrosion limits and disposition of corroded pipe in accordance with 451.6.2a6 and 451.6.2a7		Meets	OP-6.28 to 6.33
464(b)	Mitigate external corrosion with cathodic protection, internal corrosion per 462.1, exposed pipe with protective coating or paint		Meets	OP-6.53 to -6.59, OP-15.1 to -15.6
464(c)	Pipe replaced due to external corrosion shall be coated. Exposed pipe shall be corrosion resistance steel, coated or painted		Meets	OP-6.54, -6.58, MC-19
464(d)	Past corrosion shall be considered and controlled for repaired, replaced or reconditioned pipe		Meets	OP-6.54, O2-OPR-1575, O2-OPR-1581
465	Records		n/a	Background information
465(a)	Records and maps of cathodically protected pipe and facilities to be maintained as long as piping is in service		Meets	O2-OPR-1575, O2-OPR-1581
465(b)	Results of tests and inspections to be maintained for the service life of the system		Meets	OP-19.5,-19.6, -19.10 to -19.13