

Safety of Gas Transmission and Gathering Pipelines

RIN: 2137-AE72

Docket: PHMSA - 2011 – 0023

Gas Pipeline Advisory Committee Meeting

December 14 - 15, 2017



Recap of January 11 - 12, 2017 Meetings

Topic	Result
6-month Grace Period for 7 calendar year Reassessment Intervals § 192.939(b)	Vote: Passed
Safety Features on ILI Launchers/Receivers § 192.750	
Seismicity § 192.917	
Inspections Following Extreme Events § 192.613	
Management of Change § 192.911	
Corrosion Control	Discussed and Deferred to June 2017 Mtg. (Slide 3)
Records	
IM Clarifications	



Recap of June 6 - 7, 2017 Meetings

Topic	Result
Corrosion Control; §§ 192.319, 192.461, 192.465, 192.473, 192.478, 192.935(f) & (g), Appendix D	Vote: Passed
Records; §§ 192.5(d), 192.227(c), 192.285(e)	
IM Clarifications; §§ 192.917(a), (b), (c), (d), & (e) (2), 192.935(a)	
MAOP Exceedances; §§ 191.1, 191.23, 191.25, 191.29	
Records; §§ 192.13(e), 192.67, 192.127, 192.205, 192.619(f)	Discussed: Vote Postponed
IM Clarifications; §§ 192.917 (e) (3) & (e) (4)	
Material Documentation; § 192.607	



Agenda for December 14 - 15, 2017 Meetings

1. Material Documentation – 192.607

**2. Integrity Verification Process (IVP) -
192.624; 192.619(e); 192.503**



Agenda for December 14 - 15, 2017 Meetings

(If time allows)

3. Strengthened Assessment Requirements

- a. 192.493 – Industry standards for ILI
- b. 192.921(a) – Expand assessment methods allowed for IM
- c. 192.923(b) & 192.927 - ICDA
- d. 192.923(c) & 192.929 - SCCDA
- e. App. F – Guided Wave Ultrasonics (GWUT)
- f. 192.150 – Passage of Internal Inspection Devices



Remaining Agenda Items for Future Meetings (Scheduled: March 26-28 & June 12 – 14, 2018)

- Votes on topics tabled from Meeting #2 (Records, IM Clarifications) and discussed in Meeting #3 (Material Documentation)
- Topics not covered or completed from this meeting
- Assessments Outside of HCAs, Repair Criteria
- Gathering Lines
 - Reporting (Part 191)
 - Safety 192.8; 192.9; other conforming changes



Material Documentation: Proposed 192.607

7



Material Documentation 192.607

The Issue of Missing Records

- Immediately after the PG&E accident at San Bruno, NTSB issued 3 urgent recommendations to PG&E. NTSB recommended that PG&E:
 - Conduct an immediate search for missing records
 - Use verifiable records to determine a valid MAOP, and
 - If a valid MAOP cannot be substantiated, conduct pressure tests to re-establish a valid MAOP
- The results of the PG&E review revealed that PG&E could not substantiate MAOP for a significant amount of PG&E's transmission system





Material Documentation 192.607 Implications to Industry

- In response to the PG&E problems revealed by the records review, Congress mandated (2011 Act, Section 23) that:
 - All pipeline operators conduct a records review for segments in HCAs and Class 3 and 4 locations, and report the results to PHMSA
 - “The purpose of the verification shall be to ensure that the records accurately reflect the physical and operational characteristics of the pipelines ... and confirm the established maximum allowable operating pressure of the pipelines”



Material Documentation 192.607

Implications to Industry

- To establish design and maximum operating pressures (MAOP)
- For integrity management (IM)
- Anomaly evaluations for safe operating pressure

Metallurgical and Pipe Test Report MTR No.: 4600626362-4625
Sample No.: J06206474

PO Number: 4600020362 PO Date: 11/04/05 Date: 03/15/06
Diameter (in): 42 Wall (in): 0.438 Grade: X70 PSL2 Heat No: S04825
Comments: A 20VS7AL

Cust Spec: SPEC 101, REV 4, DATED 01-17-06
API 5L October 2004 43rd Ed LSAW MATERIAL 100% Yield seam inspection by ultrasonic testing method. Calibration standard: NI notches and 1/8" through drilled hole

Physical Analysis:

	Cwidth (Inch)	Yield (PSI)	Tensile (PSI)	Elong (%)	YT Ratio	Weld Tensile	Fracture Location
TBT	1.50	75006	87007	38	0.86	BASE METAL	
TWT	1.47		89203			Guided Bend (WELD)	
						Root	Face
						OK	OK

Hydrostatic Test

HYDRO PSI	HYDRO TIME (sec)
1402	20

MINIMUM HYDROTEST PRESSURE FOR THIS HEAT IS 1402 PSI @ 90% MACRO OK

Type	C	Mn	P	S	SE	Cu	Ni	Cr	Mo	Ti	Al	N	V	B	Nb	Ca	Zr	CE	Pcm	V + Ti
Ladle	0.08	1.50	0.006	0.005	0.27	0.02	0.02	0.18	0.01	0.013	0.027	0.007	0.065	0.0005	0.054	0.002	0.000	0.39	0.19	0.13
Prod1	0.06	1.53	0.007	0.007	0.26	0.01	0.01	0.15	0.00	0.017	0.036	0.004	0.059	0.0002	0.057	0.002	0.000	0.38	0.18	0.13
Prod2	0.08	1.53	0.006	0.006	0.26	0.01	0.01	0.16	0.00	0.017	0.035	0.004	0.059	0.0001	0.057	0.002	0.000	0.38	0.18	0.13

CE MAX = 0.41%, PCM MAX = 0.21%

Hardness Analysis

1	2	3	4	5	6	7	8	9	10
188	192	188	192	188	192	188	192	188	192
188	192	188	192	188	192	188	192	188	192
188	192	188	192	188	192	188	192	188	192
188	192	188	192	188	192	188	192	188	192
188	192	188	192	188	192	188	192	188	192

(HV10 - Scale) 26: 180

DWTT Analysis

Temp	Shear 1 (%)	Shear 2 (%)	Shear 3 (%)	Shear Avg (%)
32 F	100	97	99	

Charpy Impact Analysis

DrNotch: Spec Size	Temp	Ft lb1	Ft lb2	Ft lb3	Ft lb avg	Shear1 (%)	Shear2 (%)	Shear3 (%)	Shear Avg (%)
TBC 10x10 mm	32 F	128	133	173	145	100	100	100	100
THC 10x10 mm	32 F	110	115	112	112	100	100	100	100
TWC 10x10 mm	32 F	89	81	85	85	100	100	100	100

Fracture Toughness Criteria: As per API 5L, PSL2, SPSA @ 32 F, SPSB @ 30 F-33 F, SPS @ 32 F
The material has been manufactured, sampled, tested, and inspected in accordance with this spec (API 5L) and has been found to meet the requirements. IMA verify the above to be correct as contained in the records of the company.

Physical Analysis:

	Cwidth (Inch)	Yield (PSI)	Tensile (PSI)	Elong (%)	YT Ratio
TBT	1.50	75006	87007	38	0.86
TWT	1.47		89203		



Material Documentation 192.607

Implications to Industry

- In 2016, operators reported ~4,500 miles of pipe in HCAs and Class 3 & 4 locations had inadequate records to confirm MAOP (11% of ~40,000 miles)

Location	Miles with Incomplete Records	Total HCA + Class 3 & 4 (Miles)
HCAs	2,144 (11%)	20,374
Class 3 (non-HCA)	2,372 (12%)	19,648
Class 4 (non-HCA)	19 (9%)	202
Total	4,535 (11%)	40,224



Incomplete Records

192.619(c) Grandfathered Pipe

2016 Operator Annual Report Data

Location	Grandfathered Miles w/ Incomplete Records	Total Grandfathered (Miles)
Class 1 (HCA)	19 (22%)	87
Class 1 (non-HCA)	[data not collected]	37,764
Class 2 (HCA)	15 (28%)	54
Class 2 (non-HCA)	[data not collected]	2,592
Class 3 (HCA)	475 (31%)	1,512
Class 3 (non-HCA)	607 (30%)	2,041
Class 4 (HCA)	5 (45%)	11
Class 4 (non-HCA)	18 (95%)	19
Total	1,139 (2.5%) (Total addressed per 2011 Act §23)	44,080



Material Documentation

192.607 (2016 Operator Annual Report Data)

Pipeline Miles with Missing Records	Number of Operators
0 miles	876
0 – 1 miles	34
1 – 10 miles	56
10 - 100	55
100 – 1,000	9



Material Documentation 192.607

Implications to Industry

- For segments without such records, Congress also mandated (2011 Act, Section 23) that PHMSA
 - Require the operator to reconfirm a maximum allowable operating pressure as expeditiously as economically feasible; and
 - Determine what actions are appropriate for the pipeline owner or operator to take to maintain safety until a maximum allowable operating pressure is confirmed.



Material Documentation

192.607

Implications to Industry

- In addition, Congress (as well as NTSB in its report on the PG&E accident at San Bruno) included other mandates and recommendations that have significant implications to the issue of missing records to substantiate MAOP
 - **PSA of 2011 - § 23(a) 60139(d) mandate “Testing Regulations”** - **pressure testing** or alternative equivalent means such as ILI program for all **Gas Transmission pipe (Class 3, 4 and all HCAs) not previously tested**;
 - **NTSB P-11-14 “Delete Grandfather Clause”** - recommends **all grandfathered pipe be pressure tested, including a “spike” test for HCA and non-HCA segments**
 - **NTSB P-11-15 “Seam Stability”** - recommends **pressure test to 1.25 x MAOP** before treating latent manufacturing and construction defects as “stable” **for all pipe, both HCA and non-HCA segments**





Material Documentation 192.607 Alternatives PHMSA Considered

- A “no action” alternative is not feasible
 - Congress has mandated action that is now law
 - Actions required by existing regulations (49 CFR 192.107) to establish material properties for unknown pipe segments would be prohibitively expensive.
 - Alternatively, operators would have to assume a lower pipe yield strength of 24,000 psi.



Material Documentation 192.607 Alternatives PHMSA Considered (cont.)

- Cutting out pipe samples for testing is prohibitively expensive
- Simply pressure testing the pipe does not address missing records needed for reasons other than establishing MAOP, such as integrity evaluations
 - Information needed for analyzing/prioritizing defects for repair, etc.
- All pipe segments (HCA and non-HCA) are currently subject to repair requirements, which require material properties to be known.



Material Documentation

192.607

Proposed Rule to Re-establish Material Properties

- PHMSA proposed a process that is based on an *opportunistic* sampling approach
 - *No mandatory excavation solely for verification of pipe material properties would be required*
 - Verify material properties *as opportunities present themselves during the course of normal operations and maintenance*, such as excavations for evaluation or repair of anomalies or defects
 - Allow non-destructive testing to verify material properties where feasible
 - Operator could elect destructive testing per existing code (e.g., if the segment is being replaced anyway)
 - Components such as valves, flanges, and fabrications could be verified by code stamp and other markings



Material Documentation 192.607

Proposed Rule to Re-establish Material Properties (cont.)

- **PHMSA proposed a process that is based on an opportunistic sampling approach:**
 - Over time operators will gain data and records to provide confidence in material properties (PHMSA did not propose a schedule or deadline for completion)
 - Use the results to extrapolate to other unknown segments
 - Discontinue the program after a specified number of segment properties had been verified



Material Documentation

192.607 (2004-2016 Operator Annual Report Data)

Industry Repairs	HCA Repairs 13 Yr. Totals	HCA Repairs/Yr (Average)	2016 HCA (Miles)
Total HCA Repairs (2004-2016)	10,486	807/yr. (all operators)	20,374
Top 2 operators with HCA repairs	1,441 (14%)	55/yr/operator	438 (2%)
Top 15 operators by HCA Mileage	3,485 (34%)	18/yr/operator	9,162 (45%)
Top 15 operators by HCA repairs	5,293 (51%)	27/yr/operator	4,184 (20%)
Operators with few repairs (178 operators)	5,033 (49%)	2/yr/operator	14,368 (70%)

2016 Annual Report data indicates 1,034 gas transmission operators with OpIDs.

Prior to 2010, HCA miles and repairs were reported per ASME B31.8s GT IM information collection. As of 2010, this data is included in GT Annual Reports.



Material Documentation 192.607 Minimum Required Parameters

- PHMSA considered the minimum material properties that must be known to establish MAOP, and to operate and maintain the pipeline to assure operating pressure stays within the MAOP limits
- Pipe segments for which 192.607 does not apply would continue to be subject to existing rule requirements to establish unknown material properties



Material Documentation

192.607

Minimum Required Parameters (cont.)

- The minimum material properties are:
 - Diameter, wall thickness, yield strength, & tensile strength
 - Design Pressure (192.105),
 - MAOP determination (192.619(a))
 - Safe operating pressure of pipe with defects (192.933)
 - Ultimate tensile strength (See API 5L requirements, which requires reporting of UTS)
 - Required by ASME B31G equations (IBR- approved for §§192.485(c) and 192.933(a)) for calculating failure pressure and safe operating pressure.
 - Material loss equations for safe pressure determination require yield strength and flow stresses that are below the tensile strength.



Material Documentation

192.607

API 5L Specification (IBR Part 192)

Table 6 — Requirements for the results of tensile tests for PSL 1 pipe

Pipe grade	Pipe body of seamless and welded pipes			Weld seam of EW, SAW and COW pipes
	Yield strength ^a $R_{t0,5}$ MPa (psi) minimum	Tensile strength ^a R_m MPa (psi) minimum	Elongation A_f % minimum	Tensile strength ^b R_m MPa (psi) minimum
L175 or A25	175 (25 400)	310 (45 000)	c	310 (45 000)
L175P or A25P	175 (25 400)	310 (45 000)	c	310 (45 000)
L210 or A	210 (30 500)	335 (48 600)	c	335 (48 600)
L245R or BR L245 or B	245 (35 500)	415 (60 200)	c	415 (60 200)
L290R or X42R L290 or X42	290 (42 100)	415 (60 200)	c	415 (60 200)
L320 or X46	320 (46 400)	435 (63 100)	c	435 (63 100)
L360 or X52	360 (52 200)	460 (66 700)	c	460 (66 700)



Material Documentation

192.607

Minimum Required Parameters (cont.)

- Charpy v-notch toughness (only where required for failure pressure and crack growth analysis)
- Chemical properties (welding per Subpart E)
- Seam type (IMP threat analysis per 192.917, pressure testing requirements per proposed 192.624) [Note: this was a key piece of erroneous information that contributed to the PG&E accident at San Bruno.]
- Coating type (IMP threat analysis per 192.917)
- Test for the presence of stress corrosion cracking, seam cracking, or selective seam weld corrosion



Material Documentation

192.607

API 5L Specification (IBR Part 192)

Table 5 — Chemical composition for PSL 2 pipe with $t \leq 25,0$ mm (0.984 in)

Steel grade (Steel name)	Mass fraction, based upon heat and product analyses % maximum									Carbon equivalent ^a % maximum	
	C ^b	Si	Mn ^b	P	S	V	Nb	Ti	Other	CE _{IW}	CE _{Pcm}
Seamless and welded pipes											
L245R or BR	0,24	0,40	1,20	0,025	0,015	c	c	0,04	e	0,43	0,25
L290R or X42R	0,24	0,40	1,20	0,025	0,015	0,06	0,05	0,04	e	0,43	0,25
L245N or BN	0,24	0,40	1,20	0,025	0,015	c	c	0,04	e	0,43	0,25
L290N or X42N	0,24	0,40	1,20	0,025	0,015	0,06	0,05	0,04	e	0,43	0,25
L320N or X46N	0,24	0,40	1,40	0,025	0,015	0,07	0,05	0,04	d,e	0,43	0,25
L360N or X52N	0,24	0,45	1,40	0,025	0,015	0,10	0,05	0,04	d,e	0,43	0,25
L390N or X56N	0,24	0,45	1,40	0,025	0,015	0,10 ^f	0,05	0,04	d,e	0,43	0,25



Pipe Properties Test

Example Non-destructive Test Results

	Yield Strength		Tensile Strength	
	Scan 2	Scan 3	Scan 2	Scan 3
1	72.77	73.78	94.05	94.80
2	73.54	74.38	96.55	96.15
3	72.66	71.91	99.14	97.87
4	70.96	76.43	95.12	94.83
5	76.24	71.39	96.09	100.78
Avg	73.23	73.98	96.19	96.88
Overall AVG	73.61	73.61	96.54	96.54

Yield Strength and Tensile Strength – Tests

Grade: X-70

	C	Si	Mn	V	Ti	Nb	S	P	CE
1	0.0719	0.3395	1.57	0.00268	0.015	0.037	0.00238	0.00743	0.3492
2	0.0739	0.3375	1.608	0.00259	0.015	0.0379	0.00426	0.0101	0.3577
3	0.0752	0.3475	1.626	0.00233	0.0158	0.039	0.0057	0.012	0.3629
4	0.0733	0.3407	1.62	0.00253	0.0154	0.0376	0.00615	0.0129	0.3601
5	0.0734	0.3357	1.618	0.00276	0.0152	0.0381	0.00597	0.0129	0.3605
AVG	0.074	0.340	1.608	0.003	0.015	0.038	0.005	0.011	0.358
ST DEV	0.001	0.004	0.020	0.000	0.000	0.001	0.001	0.002	0.005

Pipe Chemistry Field Test Results



Material Documentation

192.607

Other Issues

- PHMSA proposed to require operators establish sample populations based on similar or comparable pipe to address:
 - Vintage
 - Manufacturer
 - Type of Seam
 - Pipelines acquired from others
 - Segments of pipeline systems that have been replaced
 - Other reasons for variation in unknown pipe properties



Material Documentation 192.607

- **Committee Comments:**
 - Clarify that two separate activities drive the need for material documentation, which should be addressed separately
 - MAOP Reconfirmation for pipelines that do not have traceable, verifiable, and complete records supporting the current MAOP, including previously-untested pipe
 - Address data needed in 192.624
 - Application of Integrity Management principles
 - Material data/records needed to support anomaly response and remediation calculations



Material Documentation 192.607

- **Committee Comments:**
 - Committee was supportive of the opportunistic approach for verifying material properties
 - Industry commented to allow a statistical sampling plan developed by operators instead of specifying number of samples



Material Documentation

192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - Revise proposed 192.607(a) to delete applicability statements
 - 192.607 would be silent on when material verification is needed ... it would simply provide the procedure for doing so, if and when required by 192.624 or other code sections
 - Allow the procedure in 192.607 to be used whenever required or allowed by other sections in Part 192 to address applicable missing records
 - “(a) Wherever required or allowed by this Part, operators must verify unknown material properties in accordance with this section.”
 - Provide confirmation that 192.607 does not apply to gathering or distribution pipelines.



Material Documentation 192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - Eliminate paragraph (b) – Development of a Program Plan
 - In the context of proposed changes to paragraph (a), paragraph (b) is no longer needed.



Material Documentation

192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - Revise proposed 192.607(c), Documentation, to delete the minimum list of required attributes
 - 192.607(c) would be silent on the specific attributes that need to be verified ... it would simply specify that operators must keep records for the attributes documented under 192.607.
 - Allow operators to use 192.607 to reverify any pipeline attributes as applicable, based on the specific driver or purpose needed, as required in other sections of Part 192.
 - (c) “Each operator must have and retain for the life of the pipeline traceable, verifiable, and complete records documenting pipe properties (such as diameter, wall thickness, grade, yield strength, ultimate tensile strength, seam type, or pressure rating, etc.), **established under this section.**”



Material Documentation

192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - In the context of considering the proposed changes to paragraphs (a), (b) and (c), consider retaining the basic aspects of the procedure specified in 192.607(d).
 - Retain opportunistic sampling approach of obtaining material properties when excavations are performed for repairs or other reasons, using a one-per-mile standard proposed in the NPRM.
 - However, if operators desire to use their own statistical approach, retain the requirement to allow operators to submit a notification to PHMSA with their proposed approach.
 - For sampling programs developed by operators, with notification to PHMSA, establish a minimum standard that sampling programs must be based on a minimum 95% confidence level.
 - Reduce the notification timeframe from 180 days to 90 days to assure more timely review by PHMSA for objection/no objection.



Material Documentation

192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - Consider the following changes to the sampling procedure in 192.607(d)
 - Reorganize the requirements to separate the sampling aspects into a separate paragraph
 - This will better accommodate situations where a single material verification test is needed (e.g., additional information is needed for an anomaly evaluation/repair)
 - Retain flexibility to use either non-destructive or destructive methods for property verification.
 - 192.607(d) (3) (iv)-Drop accuracy specifications (retain requirement that test methods must be validated)
 - 192.607(d) (3) (v)-Drop mandatory requirements for multiple test locations for large excavations (multiple joints).
 - 192.607(d) (3) (vi)- For NDE tests, reduce number of quadrants at which tests must be made from 4 to 2.



Material Documentation

192.607

- **Based on committee discussion, PHMSA suggests the committee consider:**
 - Consider the following changes to 192.607(d)(3)(viii) with respect to how to address sample test failures:
 - Delete specified program requirements for how to address sampling failures (i.e., delete the expanded sample requirements)
 - Replace with a requirement for operators to determine how to deal with sample failures through an expanded sample program that is specific to their system and circumstances.
 - Require notification to provide expanded sample program to PHMSA.
 - For sampling programs developed by operators, with notification to PHMSA, establish a minimum standard that sampling programs must be based on a minimum 95% confidence level.



Material Documentation 192.607

Public Comments



Material Documentation 192.607

GPAC Discussion



IVP Introduction



Integrity Verification Program (IVP)

192.619(e); 192.624; 192.506

- Statutory Mandates and NTSB Rec.**
- Material Documentation**
- MAOP Determination**



Congressional Mandates

Pipeline Safety Act of 2011

- *PSA §23(a) 60139(a) & (b)* – Verification of Records and Reporting –
 - Requires operators to identify **pipe segments for which they do not have records to substantiate MAOP for all Gas Transmission steel pipe (Class 3, 4 and all HCAs);**
 - Exceedance of MAOP build-up allowed by pressure limiting device must be reported within 5-days.
- *PSA §23(a) 60139(c)* – *Determination of MAOP*
 - **Reconfirm MAOP for pipeline segments with insufficient records.**



Congressional Mandates

- *PSA §23(a) 60139(d) - **“Testing Regulations”***
 - Requires **conducting tests** to confirm the material strength of previously untested natural gas transmission steel pipelines **in high consequence areas (HCAs)** and operating at a pressure greater than **30 % SMYS** that were not previously pressure tested;
 - Tests can be either **pressure testing** or “other alternative methods, including in-line inspections, determined by the Secretary to be of **equal or greater effectiveness**”



NTSB Recommendations

- ***NTSB P-11-14 “Delete Grandfather Clause”***
 - recommends all **grandfathered pipe** be pressured tested, including a **“spike” test**;
- ***NTSB P-11-15 “Seam Stability”*** –
 - recommends **pressure test to 1.25 x MAOP** before treating latent manufacturing and construction **defects** as **“stable.”**
- ***NTSB P-11-17 “Piggable Lines”*** -
 - Configure **all lines to accommodate smart pigs**, with priority given to older lines



Integrity Verification Program

192.619(e); 192.624; 192.506

Basic Principles of IVP Approach

- **IVP is based on 4 principles**
 1. Apply to high risk locations
 - High Consequence Areas (HCAs), Class 3 and 4 Locations and Moderate Consequence Areas (MCAs)
 2. Screen segments for categories of concern (i.e., “Grandfathered” segments; bad records; History of Failures Attributable to M&C Defects)
 3. Assure adequate material and documentation
 4. Perform assessments to establish MAOP



Integrity Verification Program

192.619(e); 192.624; 192.506

Principles #1 & #2

Apply to High Risk Locations

- **Apply process to pipeline segments with:**
 - Grandfathered Pipe
 - HCA/Class 3 locations/Class 4 locations and Piggable MCA lines
 - Lack of Material Documentation and Pressure Test Records
 - HCA/Class 3 and Class 4 Locations
 - History of Failures Attributable to M&C Defects
 - HCA/Class 3 locations/Class 4 locations and Piggable MCA lines
 - PHMSA estimates approximately 8,089 miles of GT pipe (approximately 3% of total GT mileage) would meet screening criteria & require IVP assessment to establish MAOP



Integrity Verification Program

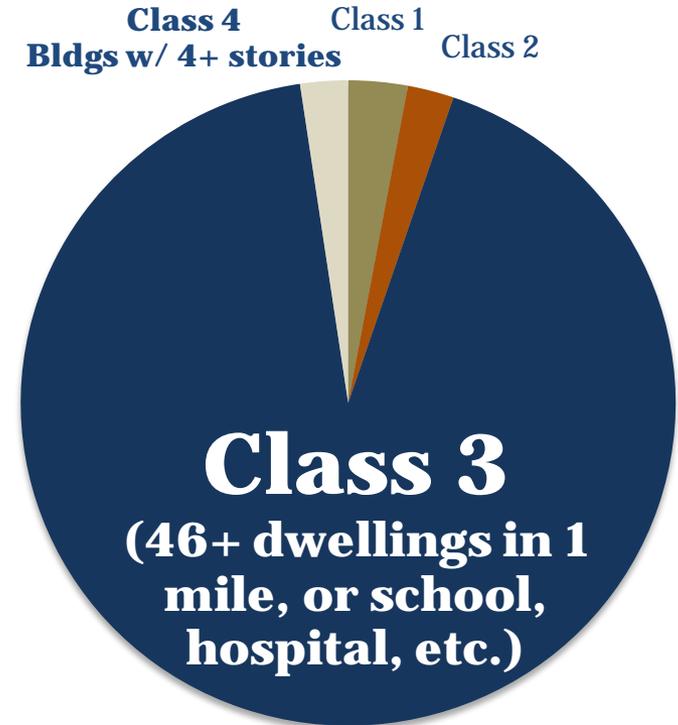
Grandfather Clause – A brief history

- **192.619(c) – Grandfather Clause**
 - MAOP pressure restrictions in 192.619(a) do not apply
 - Segment must be in satisfactory operating condition
 - May use highest actual operating pressure to which the segment was subjected from July 1, 1965 to July 1, 1970 – 5-year operating period
 - Must still comply with 192.611



Incomplete records and Grandfathered Pipe: Primarily Located in Populated Areas

Incomplete MAOP Records and Grandfathered Pipe by Class Location			
Class Location	Incomplete Records	Grandfather Clause (HCA)	Total
Class 1	95	87	181
Class 2	88	54	142
Class 3	4,221	1,512	5,733
Class 4	135	11	146
Total	4,539	1,664	6,203



Source: 2016 Gas Transmission Operator Annual Reports submitted to PHMSA



Class Locations	Class 1	Class 2	Class 3	Class 4
Definition: Dwellings along a 1-mile length and 660-feet on either side of the pipeline	10 or fewer dwellings	11-45 dwellings	46 or more dwellings OR occupied sites	Buildings with 4 or more stories are prevalent
Examples	Very rural areas	Sparse suburbs, small towns and villages	Urban areas, suburban developments	Urban downtowns, apartment complexes

Relative Potential Consequences to People



Class 3

Class 4



Incomplete Records and Grandfathered Pipe

Estimated Mileage by Pipe Diameter and Stress Classification

Pipe Diameter and Percent SMYS	Incomplete Records*	Grandfather Clause**	Total
Greater than 8" and greater than or equal to 30% SMYS	3,247	1,191	4,438
Less than or equal to 8" and less than 30% SMYS	1,288	473	1,761
Total	4,535	1,664	6,199

- **Source: 2016 Gas Transmission Operator Annual Reports submitted to PHMSA, Parts H, K, and Q.**
- **SMYS: Specified Minimum Yield Strength**
- *** Data for HCA and Class 3&4**
- **** HCA only (note: 2,060 miles of grandfathered pipe in non-HCA Class 3&4; and 40,356 miles in non-HCA Class 1 & 2 locations)**



Reportable Onshore Steel GT Incidents Caused by Crack or Material Defects (2010 - Nov. 2017)

- **104 Total Incidents**
 - 68 were constructed before 1971.
 - 18 were constructed 1971 or later.
 - 18 Year of construction not reported.
- **45 Incidents (43%) occurred after a post-construction pressure test**



Integrity Verification Program

192.619(e); 192.624; 192.506

Principle #3

Know & Document Pipe Material

- **We reviewed Material Documentation in previous section, but it is an important aspect of IVP**
- **If Missing or Inadequate Validated Traceable Material Documentation, in HCA or Class 3 or 4 Location then Establish Material Properties by an approved process:**
 - Cut out and Test Pipe Samples (Code approved process)
 - *In Situ* Non-Destructive Testing (if validated and Code approved)
 - Field verification of code stamp for components such as valves, flanges, and fabrications
 - Other verifications
- Note that ASME B31.8S, Section 4 and Table 1 have required this information since the inception of the IM rule (IBR)



Integrity Verification Program

192.619(e); 192.624; 192.506

Principle #4 Methods to Establish MAOP

- Allow Operator to Select Best Option to Establish MAOP
- **Main Options for Establishing MAOP**
 - Pressure test (with Spike Test if needed for crack threat)
 - Pressure Reduction (recent actual operating pressure divided by Class Location factor)
 - Engineering Critical Assessment (ECA)
 - Replace
 - 10% Pressure Reduction, with additional monitoring and survey frequency (for smaller pipe)
 - Other technology (with notification to PHMSA)



Integrity Verification Program

192.619(e); 192.624; 192.506

MAOP Determination

- **192.624 (c) MAOP Determination**
 - **Method 1: Pressure Test**
 - Greater of either 1.25, or class location test factor, times MAOP
 - Spike test segments w/ reportable in-service incident due to legacy pipe/construction, cracks (e.g. SSWC, SCC), etc.
 - Estimate remaining life for segments w/crack defects
 - **Method 2: Pressure Reduction**
 - Reduce MAOP to the highest operating pressure divided by greater of 1.25 or class location test factor
 - Estimate remaining life for segments w/crack defects



Integrity Verification Program

192.619(e); 192.624; 192.506

MAOP Determination

- **192.624 (c) MAOP Determination**
 - **Method 3: Engineering Critical Assessment (ECA)**
 - ECA analysis - MAOP based upon lowest predicted failure pressure (PFP)
 - Segment specific technical and material documentation
 - Analyze crack, metal loss, and interacting defects remaining in the pipe, or that could remain in the pipe, to determine PFP
 - MAOP established at the lowest PFP divided by the greater of 1.25 or the applicable class location factor listed in § 192.619(a) (2) (ii).



Integrity Verification Program

192.619(e); 192.624; 192.506

MAOP Determination

- **192.624 (c) MAOP Determination**
 - **Method 4: Pipe Replacement**
 - **Method 5: Low Stress ($\leq 30\%$ SMYS), Small Potential Impact Radius (PIR ≤ 150 ft.) and Diameter (≤ 8 inches)**
 - 10% Pressure Reduction
 - Enhanced patrols & leakage surveys
 - **Method 6: Alternative Approach**
 - **90-day notification to PHMSA**



Method 5: Low Stress ($\leq 30\%$ SMYS), Small Potential Impact Radius (PIR ≤ 150 ft.) and Diameter (≤ 8 inches)

- Potential Impact Radius – 150 feet
 - 8-inch – MAOP of ~ 730 psig or less
 - 6-inch – MAOP of ~ 1300 psig or less
 - 4-inch – MAOP of ~ 2900 psig or less



Integrity Verification Program

192.619(e); 192.624; 192.506

Compliance Deadlines

- **192.624 (b) Compliance Deadlines**
 - Develop plan – 1 year
 - 50% mileage by end of Year 8
 - 100% mileage by end of Year 15
 - If operational or environmental constraints limit meeting deadlines, operator may petition Associate Administrator of OPS for 1-year extension



Integrity Verification Program

192.619(e); 192.624; 192.506

Fracture Mechanics Modeling

- **192.624 (d) Fracture mechanics modeling for failure stress and cyclic fatigue crack growth analysis**
 - Pipe susceptible to cracks or crack-like defects
 - Fatigue analysis techniques
 - Analyze microstructure (ductile/brittle or both), location and type of defect, and operating conditions/pressure cycling
 - 2nd re-evaluation before 50% of the remaining life has expired, but within 7 years
 - Results confirmed by Subject Matter Expert (SME)



Integrity Verification Program

192.619(e); 192.624; 192.506

Spike Test (§192.506)

- **Applies to those pipelines that:**
 - Are required to be assessed, have a hoop stress of $\geq 30\%$ SMYS and have integrity threats that cannot be addressed by ILI ; or
 - Have their MAOP established in accordance with Method 1, Pressure Test, in § 192.624 and the pipeline includes legacy pipe or segments that had certain incidents (e.g., crack, manufacturing, or installation related, see § 192.624(c)(1)(ii)).
- **Test method**
 - Spike Test minimum of the lessor of:
 - 1.50 times MAOP, or 105% SMYS
 - Spike Duration: 30-minutes
 - Total Test Duration: 8-hours

58

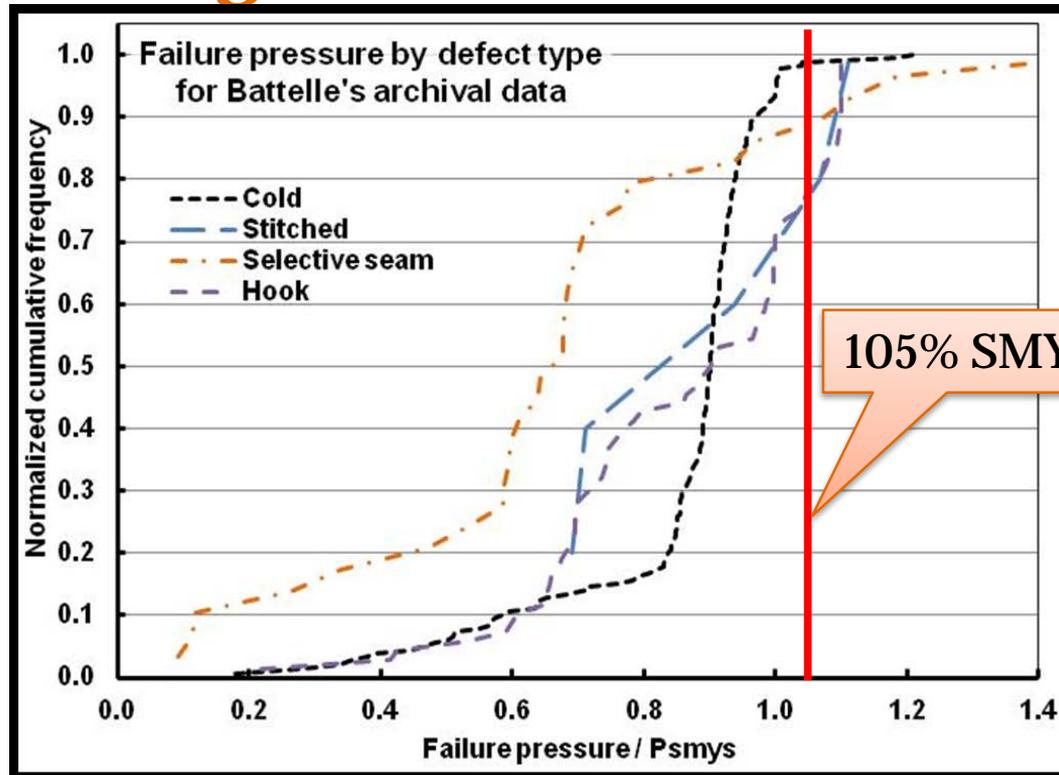


Integrity Verification Program

192.619(e); 192.624; 192.506

Spike Test (192.506)

Long Seam ERW Failures



Information from PHMSA Long Seam ERW R&D Program – over 600 failures from Battelle, Kiefner, and DNV database; <https://primis.phmsa.dot.gov/matrix/PrjHome.rdm?prj=390>



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.503



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Proposed 192.503 includes a cross-reference to proposed 192.624. Because proposed 192.624 is limited in applicability, a cross-reference to that section in a portion of the regulations with broader applicability without a corresponding limitation consistent with the applicability of 192.624 is inappropriate. Recommend removal of the cross-reference to 192.624 in 192.503 or reword to stress that 192.624 applies only if applicable.
- **PHMSA**: concurs and proposes to withdraw the proposed revision to 192.503(a)(1).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.619(e) & 192.624(a)

Scope and Applicability



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- 192.619(e)(5) – Terms for small Potential Impact Radius (PIR) and diameters should be defined.
- **PHMSA:** criteria is specified in 192.624. Method 5 applies to line ≤ 8 inches diameter and ≤ 150 ft. PIR and $< 30\%$ SMYS and which cannot be assessed using inline inspection or pressure test.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- PHMSA is proposing a new paragraph 192.619(e) that, as written, would invalidate the rules of paragraphs (a) through (d). One hopes that this was a clerical error on PHMSA's part. PHMSA should consider changing the wording of the proposed paragraph (e) to not exclude or invalidate paragraphs (a)(1) and (a)(2).
- **PHMSA:** believes the proposed rule is correct as written and does not exclude or invalidate 192.619(a)(1) or (a)(2), since 192.624 only applies in limited cases where operators don't comply with (a) through (d) or else the pipe is grandfathered in Class 1 and 2 HCAs, or located in Class 3-4. An operator that established MAOP in accordance with 192.619(a) would not have to re-establish MAOP unless the criteria in 192.624 is met.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- The interplay between MAOP determination in 192.619 and MAOP verification in 192.624 is not clear as presently proposed. Concern is the uncertainty that compliance with 192.624 would not be viewed as compliance with the requirements of 192.619. PHMSA should add a section to 192.619 that indicates compliance with the requirements of 192.624 to verify a pipeline segment's MAOP satisfies the requirements of 192.619 to establish the MAOP of the pipeline segment.
- **PHMSA**: compliance with 192.624, when required, complies with 192.619. PHMSA proposed to add new paragraph 192.619(e) to provide this clarification.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- PMHSA should recognize in the regulations that existing pipeline segments with traceable, verifiable, and complete pressure test records necessary to establish MAOP per Subpart J do have a valid MAOP through 192.619(a)(2), and using material records to verify MAOP through 192.619(a)(1) is duplicative and unnecessary for pipeline safety.
- **PHMSA**: 192.619(a)(1) and (a)(2) are not duplicative. MAOP is lowest of 192.619(a)(1), (a)(2), (a)(3) and (a)(4). Operators must know all four and have records for all four in order to demonstrate MAOP in accordance with 192.619(a).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- PHMSA should clarify the distinction between MAOP Determination and MAOP Verification. This clarification should confirm the fact that MAOP Verification, like MAOP Determination, is a one-time requirement for specifically defined transmission pipelines, and that only one method is required to verify MAOP.
- **PHMSA**: this is the intent. PHMSA will clarify in the preamble to the final rule that both are one time processes to establish MAOP.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- 192.619(a)(2) - Is MAOP based on the most recent pressure test or the historical highest pressure test.
- **PHMSA:** It depends. A pressure test may be used to establish MAOP if the test pressure divided by the applicable class location test factor is the lowest of all four of (a)(1), (a)(2), (a)(3), and (a)(4).

Operators must know all four in order to establish MAOP which is the lowest of the four. Note that (a)(4) requires operators to consider the history of the segment, including known corrosion.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- 192.619(a) applies to establishing maximum allowable operating pressure (MAOP) for all pipelines. Revise proposed 192.619(a)(4) to state clearly material verification is applicable only to transmission pipeline segments that are subject to 192.607 and include an implementation date to clarify the proposed requirements apply going forward and any previous pressure test Subpart J sufficiently validates the MAOP.
- **PHMSA**: supports clarifying this by adding “if applicable” after the reference to 192.607 in 192.619(a)(4). Implementation date is specified in 192.624. Operators that are required to verify MAOP in accordance with 192.624 have 15 years from the effective date of the rule [192.624(b)(3)].



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Recommend that 192.619(e) be removed entirely from the regulations. Alternatively, the language of proposed 192.619(e) should be revised to simply direct operators of onshore steel transmission pipelines that meet the criteria of 192.624(a) to that section for verification of the MAOP.
- **PHMSA**: supports revising 192.619(e) to read: “(e) Notwithstanding the requirements in paragraphs (a) through (d) of this section, onshore steel transmission pipelines that meet the criteria specified in 192.624(a) must establish and document the maximum allowable operating pressure in accordance with 192.624.”



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Suggest that PHMSA revise 192.619(e) to be more conservative for those pipelines that have had a reportable in-service incident since its most recent subpart J pressure test, due to an original manufacturing or construction-related defect.
- **PHMSA**: that is one of the criteria in 192.624.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Concerned that the proposed 192.624 goes significantly beyond the Congressional Mandate contained in the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 (“2011 Act”) ; driving significant additional costs that have diminishing pipeline safety benefit.
- **PHMSA**: In addition to the Act of 2011, Section 23, which addresses grandfathered pipe in HCA/Class 3/Class 4, and pipe without MAOP records, PHMSA is addressing numerous other NTSB recommendations and pipeline safety issues. The entire estimated mileage to which IVP would apply is approximately 5% of GT mileage.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- The inclusion of every reportable in-service incident in the requirements for verification of MAOP is overly broad and should be removed from the final rule, or at least limited to a more contemporary time frame such as a rolling 15-year window or to those incidents occurring since 2003.
- **PHMSA:** Every reportable incident is not included. The proposed rule limits the incidents to certain causes (i.e., original manufacturing-related defect, a construction-, installation-, or fabrication-related defect, or a cracking-related defect), and only for segments in HCAs or Class 3 or Class 4 locations that have occurred since the most recent successful pressure test. This is a small subset of all reportable incidents.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Suggest that 192.624(a)(1) be revised to apply only prospectively and not retroactively.
- **PHMSA**: The intent of the rule and the Congressional mandate is to address pre-existing pipe without adequate basis for MAOP and Grandfathered pipe.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- The 2011 Act does not require MAOP reconfirmation for MCAs. PHMSA should modify 192.624(a) so that MAOP reconfirmation is only required in MCAs that operate at greater than 30% of SMYS and can accommodate an “instrumented inline inspection tool.”
- **PHMSA**: the Congressional mandate does not allow exceptions to avoid MAOP reconfirmation. All applicable pipe in HCAs and all non-HCA Class 3 and 4 (regardless of MCA location or piggability) must have MAOP verification. Line segments less than 30% SMYS were not excluded to support addressing NTSB recommendations P-11-14 and P-11-15 for those lines included in the scope of 192.624(a).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- PHMSA is urged to make modifications that allow the engineering critical assessment (“ECA”), ILI and other alternative technologies to be feasible alternatives to reconfirm MAOP for MCAs. Without these modifications, operators will have to reconfirm MAOP solely by hydrostatic pressure testing.
- **PHMSA**: Only segments meeting the applicability criteria must reconfirm MAOP. Operators may choose any of the 6 allowed methods to reconfirm MAOP. This includes the use of alternative technologies (Method 6) with notification to PHMSA.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Recommend that PHMSA remove the applicability in 192.624(a)(1) and address this concern through 192.917(e)(3) and §192.1119 (proposed new subpart Q). This would provide clarity for pipelines that have had a reportable in-service incident due to manufacturing and construction related defects both in the past and in the future.
- **PHMSA:** 192.917 only applies to HCAs and would not be responsive to NTSB Recommendation P-11-15, which recommended that PHMSA amend regulations to require that manufacturing- and construction-related defects can only be considered stable if a gas pipeline has been subjected to a postconstruction hydrostatic pressure test.
 - 192.917 is not an applicable method to establish MAOP. 192.917(e)(3) establishes criteria for determining if seam defects are stable under IM.
 - 192.917(e)(3) PHMSA proposed to allow tests conducted under 192.624 for establishing MAOP to be credited for the seam stability determination under 192.917(e)(3)

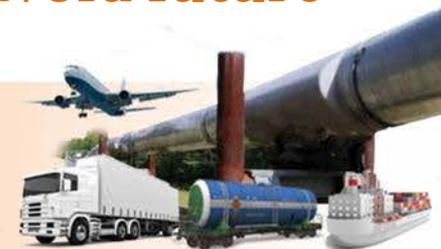


Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- PHMSA should remove pipeline segments that have experienced a reportable in-service incident from its proposed MAOP confirmation requirements under 192.624(a)(1). After an in-service failure, a pipeline operator is required to perform corrective actions and sufficiently demonstrate a restored level of safety before being allowed to return to service and/or to full pressure.
- **PHMSA**: such an approach may not address the fact that the incident suggests that MAOP might be too high for the entire pipeline. Confirming MAOP at the incident location after an incident is too late. The purpose of 192.624 is to proactively establish valid MAOP for the entire pipeline to avoid future accidents.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.624(b)

Schedule



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Concerns with implementation timeframes following the effective date of the Rule. The proposed timeframes for MAOP verification of eight and fifteen years are not feasible when considering the coordination of resources necessary to replace pipelines.
- **PHMSA**: believes 15 years is adequate. Longer than 15 years belies the urgency and seriousness of the situation for which Congress, NTSB, and GAO have all advocated for change.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- In addition to the completion dates required by 192.624(b), PHMSA should consider a requirement for operators to prioritize the actions required by this rule on a basis which requires that operators address the highest risk segments first.
- **PHMSA**: believes such prioritization is unnecessary, because 192.624 would only apply to a relatively small amount of pipeline.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- The proposed MAOP Verification in 192.624 does not address how the completion plan and completion dates required by 192.624(b) would apply to pipelines that experience the future failure and are now subject to proposed 192.624(a)(1), or for pipelines that are not currently located in an MCA but may be in the future.
- **PHMSA**: agrees that this is a valid point. PHMSA supports revising the proposed rule to address this scenario. 192.624 does not apply to MCA pipelines that are not-piggable.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.624(c)

MAOP Verification Methods 1 - 6



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Recommend that clarification be provided in regard to the 6 methods that are listed to establish a pipeline's MAOP. If one of these 6 methods is chosen, the operator should have a valid MAOP...then an operator should not also have to pressure test.
- **PHMSA**: the proposed rule clearly states that operators may choose any of the 6 methods to establish MAOP.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Concerns regarding the effort to combine varying aspects of MAOP testing with expansion of the natural gas transmission integrity management program (IMP). These 2 processes have completely separate objectives and integration into a single process may create unnecessary confusion and complexity.
- **PHMSA:** is not expanding applicability of IMP; PHMSA intends that MAOP testing be a separate process. PHMSA also intends that if an operator has to perform testing to verify MAOP under 192.624, that such assessment should also serve as an integrity assessment under IM for HCA segments or under 192.710 for non-HCA segments.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 1, pressure test]** A spike test is not required to establish an adequate margin of safety for MAOP reconfirmation, and PHMSA should eliminate spike testing from 192.624(c)(1)(ii).
- **PHMSA**: Spike testing is suitable for cases where pipe has Stress Corrosion Cracking or other crack-like defects to address critical and near critical flaws that a standard pressure test does not address.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 1, pressure test]** 192.624(c)(1) should refer to Subpart J rather than 192.505(c).
- **PHMSA**: agrees with this comment and would support incorporation of this correction.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 1, pressure test]** Clarify if paragraph 192.624 (c)(1)(iii) is intended to capture fatigue analysis and pressure test pipelines outside of HCAs, MCA's or class 3 and 4 pipe.
- **PHMSA**: requirements in 192.624 only apply to pipelines that meet the applicability criteria in 192.624(a).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 1, pressure test]** A pressure test with TVC documentation should be regarded as a valid and compelling test regardless of when it was conducted. The test parameters, not the test date, should be considered for the establishment of MAOP.
- **PHMSA**: agrees except in cases where the pipe has experienced an incident due to cracking or seam issues, since the date of the pressure test. Such failures indicate the inappropriateness of relying on historical pressure tests in those cases. This is consistent with the existing IM requirement 192.917(e)(4) which requires an integrity assessment for seam threats if the segment has experienced a failure in the preceding five years.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 2, pressure reduction]** Recommend that §192.624(c)(2) be revised to calculate the MAOP based on the existing MAOP, not the 18-month operating pressure unless an incident has occurred on the pipeline since its last Subpart J pressure test caused by a material related defect or a construction related defect.
- **PHMSA**: 192.624(c)(2) is based on usage of operating pressure to which the pipe segment is exposed as a *de facto* pressure test. Pipelines that have not operated at MAOP have not actually been subjected to MAOP pressures, thus have not demonstrated strength at those levels.
 - Operators may submit a notification under 192.624(e) if it desires to establish MAOP via pressure reduction using different criteria than Method 2.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 2, pressure reduction]** PHMSA proposes that operators search their operating records for the highest actual sustained pressure reached for 8 hours during a continuous 30-day history. There should be no limitation on when this pressure was achieved, whether 18-months or 20-years. The pipeline has proven to safely operate at these pressures for many years.
- **PHMSA**: would support changing the look-back period from 18 months to five years. Five years is consistent with the look-back period previously used for grandfathered pipe in 192.619(c).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 2, pressure reduction]** - Operators who have already reduced MAOP on pipe segments in an effort to be pro-active should not be penalized by having to take further unnecessary reductions in MAOP.
- **PHMSA**: would support increasing the look back period to 5 years.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 2, pressure reduction]** For §192.624(c)(2), clarify that the pressure reduction is taken from the immediate past 18-months or 5-years from the time the pressure reduction is contemplated, which may actually be several years after the rule's effective date. Tying the baseline pressure to the effective date of the rule is completely arbitrary when evaluating the merits of these actions on pipeline safety.
- **PHMSA**: would support a revision to clarify this requirement. Operators could also use five year look back from the period when pressure reduction is contemplated, as long as the pressure does not exceed the maximum actual operating pressure during the five year period before the effective date of the rule.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 2, pressure reduction]** Recommend limiting the requirements of 192.624(c)(2) to those pipelines operating at 30 percent SMYS or greater.
- **PHMSA**: believes it is appropriate to include lines < 30% SMYS to address the intent of NTSB recommendations and because ruptures have occurred in such lines. However, note that pipelines operating at <30% SMYS may take a lesser pressure reduction under method 5, if certain other conditions are met.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** PHMSA Should Allow Operators to Use ILI to Reconfirm MAOP.
- **PHMSA**: The use of ILI in conjunction with ECA is allowed in 192.624. However, ILI alone is not considered equivalent to a pressure test and would not meet the equivalence requirement in the congressional mandate. ECA is required to substantiate that the condition of the pipe as determined by ILI is sufficient to safely operate at MAOP.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** Operators have long relied on sound engineering judgments and conservative assumptions to account for record gaps. If stripped of the ability to use sound engineering judgment and conservative assumptions, would require a substantial investment in process, procedures, testing, and project engineering and support to develop and implement a comprehensive material documentation plan as outlined in the proposed regulations.
- **PHMSA**: appreciates this comment; however, the PG&E accident at San Bruno illustrated that this practice is not always effectual or consistently applied and this rulemaking provides more definitive standards for addressing gaps in records.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** Requests clarification on the utilization of Grade A pipe (which has an SMYS of 30,000 psi) in 192.624(c)(3)(i)(C) if the SMYS or actual material yield and ultimate tensile strength is not known or not adequately documented by TVC records versus the use of 24,000 psi for unknown SMYS as noted in 192.107(b)(2).
- **PHMSA**: in IVP, operators may assume Grade A (30,000 psi or lower) if pipe grade is unknown for purposes of establishing MAOP. [Note: operators may not uprate pipe by assuming Grade A in cases where the pipe is currently assumed to be 24,000 psi per 192.107.]



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** 192.624(c)(3)(i)(B) - ECA Analysis prescribes a body toughness of 5 ft-lb and a seam toughness of 1 ft-lb. These values are arbitrary and very conservative. 1ft-lb is below any toughness possible in low alloy carbon steel. Vintage pipelines will not have Charpy v-notch data and requiring an overly conservative assumption of toughness is not reasonable. Toughness can vary depending on manufacturer, manufacturing method and vintage and should not be prescribed in code. Use of conservative defaults, especially the overly conservative default values in PHMSA's Proposed Rule, may result in an unacceptably short remaining life.
- **PHMSA**: Based on research, the values proposed represent a ~ 95% confidence level that results will be conservative. PHMSA believes this is an appropriate safety goal. PHMSA will consider modifying the rule to allow other appropriate technology or technical publications that an operator demonstrates can provide conservative Charpy energy values of the crack-related conditions of the line pipe body and seam, as appropriate.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** Fracture Mechanics (192.624(c)) is an integral piece in addressing the threat of cracks and crack-like defects within IM. Fracture Mechanics should not be included anywhere under 192.624.
- **PHMSA**: believes that ECA with fracture mechanics analysis is important to IVP (cracks) and should be applied to all pipelines that have MAOP verified under 192.624, which includes selected non-HCA segments. IMP only applies to HCAs. Fracture mechanics analysis is an essential aspect of ECA in order to establish if the crack defects found in the pipe from ILI will withstand operation at MAOP and is required to validate that the ECA method is of equal or greater effectiveness to a pressure test.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** Commenters request removal of paragraph 192.624(c)(3) "Engineering Critical Assessment" and (d) "Fracture Mechanics".
- **PHMSA**: ECA using fracture mechanics is an important option for verifying MAOP. This standard addresses the Congressional mandate at 49 USC 60139(d)(2)(B).



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** 192.624(c)(3) - Encourages PHMSA to significantly revise the ECA method and instead provide an in-line inspection MAOP Verification method. There needs to be a pure in-line inspection solution within the methods for MAOP Verification.
- **PHMSA**: ILI alone without ECA is not sufficient to verify MAOP in a way that conforms to the Congressional mandate 49 USC 60139(d)(2)(B) to be of equal or greater effectiveness as a pressure test. ECA utilizes ILI results in conjunction with other data and fracture mechanics analysis to assure that the MAOP verified under ECA is as equally effective as a pressure test.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 3, ECA]** In cases where a pipeline has been pressure tested, but not to the level of $1.25 \times \text{MAOP}$, PHMSA should not require a retest but instead allow for the original test, for example to $1.1 \times \text{MAOP}$, to be augmented with other ECA and analysis such as what PHMSA proposes under method 3 for reconfirming MAOP under proposed 192.624(c)(3).
- **PHMSA: 192.624(c)(3)**, as proposed by PHMSA, would allow such an approach.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- **[Method 6, other technology]** Encourage PHMSA to adopt a process under which a “no objection letter” is deemed issued after 60 days.
- **PHMSA**: the notification process in the proposed rule is the same as the current IM notification process, which has worked for over 12 years of IM without problem. However, PHMSA would support changing the notification timeframe from 180 days to 90 days to assure timely review by PHMSA.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.624(d)

Fracture Mechanics



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- One of the mitigation methods listed under 192.624(d): fracture mechanics, is to perform a subpart J pressure test (item (5)); which would have already been performed under 192.624(c). This creates an endless loop of pressure testing and fracture mechanics. Suggest PHMSA remove the requirement for fracture mechanics from 192,624(c)(1)(iii); 192.624(c)(2)(ii); and 192.624(c)(5)(vii) and note these exclusions under the fracture mechanics 192.624(d).
- **PHMSA:** Fracture mechanics addresses crack growth that could grow over time such that the MAOP is compromised. In some cases, re-pressure testing might be required to demonstrate continued safety and validity of MAOP before the next IM assessment interval.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- 192.624(d) - It is unclear why fracture mechanics analysis, remaining life calculations, and retest or re- inspection interval determinations are included in the proposal for MAOP verification.
- **PHMSA:** Section 23 of the 2011 Act required that “In developing the regulations, the Secretary shall consider safety testing methodologies, including, at a minimum—
 - “(A) pressure testing; and
 - “(B) other alternative methods, including in-line inspections, determined by the Secretary to be of equal or greater effectiveness.” [*emphasis added*]

Establishing MAOP by ECA is based on analysis of remaining cracks after ILI repairs or previous pressure testing. Fracture mechanics analysis provides the basis for determining that flaws remaining in the pipe would have passed a pressure test, had a pressure test been conducted. It also establishes the basis for monitoring the potential for crack growth.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.624(e)

Notifications



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- Require a “notice to PHMSA” rather than a “no objection letter from PHMSA” in 192.624(c)(6).
- **PHMSA**: the “no objection” letter has been effectively implemented for IM notifications for many years.



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

Comments Related to 192.624(f)

Records



Integrity Verification Program

192.619(e); 192.624; 192.503

NPRM Comments

- 192.624(f) - Requirements to retain records, as well as the quality of records, must only be applied prospectively.
- **PHMSA**: 192.624(f) only applies to records needed in order to document compliance with 192.624. 192.624(f) is not a retroactive records requirement for activities that are not used to comply with 192.624.



Integrity Verification Program

192.619(e); 192.624; 192.503

- **In light of public comments received, PHMSA suggests the committee consider:**
 - Revise proposed 192.624 as indicated in the PHMSA response to public comments.
 - Withdraw the proposed revision to 192.503(a)(1)
 - Shorten and clarify 192.619(e) to remove text that duplicates requirements from 192.624, to read: “(e) Notwithstanding the requirements in paragraphs (a) through (d) of this section, onshore steel transmission pipelines that meet the criteria specified in 192.624(a) must establish and document the maximum allowable operating pressure in accordance with 192.624.”



Integrity Verification Program

192.619(e); 192.624; 192.503

- **In light of public comments received, PHMSA suggests the committee consider:**
 - Revise proposed 192.624 as indicated in the PHMSA response to public comments.
 - Revised 192.624(b) to address how the completion plan and completion dates required by 192.624(b) would apply to pipelines that experience the future failure and are now subject to proposed 192.624(a)(1), or for pipelines that are not currently located in an MCA but may be in the future.
 - Clarifying that 192.607 does not necessarily apply to all segments when determining MAOP by adding “if applicable” after the reference to 192.607 in 192.619(a)(4).



Integrity Verification Program

192.619(e); 192.624; 192.503

- **In light of public comments received, PHMSA suggests the committee consider:**
 - Revise proposed 192.624 as indicated in the PHMSA response to public comments.
 - Revise 192.624(c)(1) to refer to Subpart J rather than 192.505(c).
 - Change the look-back period for Methods 2 and 5 (Pressure Reduction) from 18 months to five years.
 - Change the notification timeframe from 180 days to 90 days to assure timely review by PHMSA.



Integrity Verification Program

192.619(e); 192.624; 192.503

Public Comments

1. Applicability

- In-service incidents
- Lack of pressure test
- Grandfathered lines

2. Methods

- Pressure test
- Pressure reduction
- ECA
- Pipe replacement
- Small diameter PIR
- Alternative technology

3. Fracture Mechanics



Integrity Verification Program

192.619(e); 192.624; 192.503

GPAC Discussion



Agenda for December 14 - 15, 2017 Meetings

3. Strengthened Assessment Requirements

- a. 192.493 – Industry standards for ILI
- b. 192.921(a) – Expand assessment methods allowed for IM
- c. 192.923(b) & 192.927 - ICDA
- d. 192.923(c) & 192.929 - SCCDA
- e. App. F – Guided Wave Ultrasonics (GWUT)
- f. 192.150 – Passage of Internal Inspection Devices



7a. Strengthened Assessment Requirements

Strengthen Standards for ILI

192.493; 192.921(a)

- **ISSUE:** The current regulations are silent on a number of issues that impact the quality and effectiveness of ILI assessments (except for a general reference to ASME B31.8S).
- **PHMSA PROPOSED TO:**
 - Incorporate by reference three industry standards:
 - **API STD 1163**, In-line Inspection Systems Qualification Standard, which is an umbrella document to be used with the following companion standards.
 - **ANSI/ASNT ILI-PQ-2010**, In-line Inspection Personnel Qualification and Certification; and
 - **NACE SP0102-2010**, In-line Inspection of Pipelines (incorporated by reference, see 192.7)



7a. Strengthened Assessment Requirements

Strengthen Standards for ILI

192.493; 192.921(a)

- **PHMSA PROPOSED TO (cont'd):**
 - Clarify that operators must explicitly consider uncertainties in reported results in identifying and characterizing anomalies. 192.921(a)(1)
 - Limit the use of direct assessment only to segments that cannot be inspected by inline inspection tools (“smart pigs”) 192.921(a)(6)
- **BASIS:** Petition for rulemaking submitted by NACE international dated Feb. 11, 2009



7a. Strengthened Assessment Requirements

Industry standards for ILI

192.493; 192.921(a)

NPRM Comments

- Many commenters supported the proposed changes.
- Commenters suggested that the rule should reference the latest versions of the standards.
- **PHMSA**: agrees that the most recent versions of the standards should be referenced.
- Recommendations in the standards should not be requirements
- **PHMSA**: believes the recommendations in those standards are important to realize the safety benefit of the standards.



7a. Strengthened Assessment Requirements

Industry standards for ILI

192.493; 192.921(a)

NPRM Comments

- Inclusion of the ASNT ILI-PQ standard applies to employees of the ILI service providers. It is unnecessary to incorporate it by reference since API 1163 requires that providers of in-line inspection services ensure that their employees are qualified according to ASNT ILI-PQ.
- **PHMSA:** according to API 1163, the three referenced standards have been developed to enable service providers and pipeline operators to provide rigorous processes, that will consistently qualify the equipment, people, processes and software utilized in the in-line inspection industry.



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- Exclude requirements contained in API STD 1163, In-line Inspection Systems Qualification Standard, Section 11, Quality Management System.
- **PHMSA**: believes that required conformance with the quality standards will enhance pipeline safety.



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- ILI vendors may not be able to meet the 90% tool tolerance specified in referenced standards.
- **PHMSA**: the referenced standards are consensus industry standards and PHMSA agrees with the industry committee that developed the standard that the tool performance standards are needed and achievable.



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- Relocate 192.493 requirements to a different Subpart - 192.710 (d), 192.921 (a)(1), and 192.937 (c)(4)
- **PHMSA**: believes that 192.493 is an appropriate place for this requirement, since ILI would be required for both HCA and non-HCA pipe segments.



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- Restore reference to B31.8S in 192.921.
- **PHMSA**: believes the industry standards IBR in 192.493 are better than ASME B31.8S.

[Note: Currently 192.921(a)(1) only requires that operators follow B31.8S, section 6.2, in selecting the appropriate internal inspection tools, and does not address how the assessment is performed.]



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- In 192.921(a)(1), acknowledge that some of the listed activities to verify tool performance are typically performed after anomalies are characterized.
- **PHMSA**: does not intend that the language in 192.921(a)(1) be interpreted outside the usual practices for performing the listed activities as outlined in the standards IBR in 192.493.



7a. Strengthened Assessment Requirements Industry standards for ILI 192.493; 192.921(a)

NPRM Comments (cont'd)

- Disagree with adding explicit requirement for a “no objection” letter for notifications of using “other technology.”
- **PHMSA**: the “no objection” letter in response to “other technology” notifications is the usual existing practice that has been implemented since the inception of the IMP rule.



7a. Strengthened Assessment Requirements Industry standards for ILI

192.493; 192.921(a)

Public Comments



7a. Strengthened Assessment Requirements Industry standards for ILI

192.493; 192.921(a)

GPAC Discussion



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

- **ISSUE:** Current regulations are silent on the use of certain integrity assessment methods that are acceptable assessment methods.
- **PHMSA PROPOSED TO:**
 - Add the following methods as allowable assessment methods:
 - “Spike” hydrostatic pressure test
 - Excavation and *in situ* direct examination
 - Guided Wave Ultrasonic Testing (GWUT) conducted as described in Appendix F;
 - Limit use of Direct Assessment to lines that are not piggable.
- **BASIS:** Operators should be able to take credit for integrity assessments conducted using methods that are not explicitly listed in the current rule without the need for submitting a notification.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

NPRM Comments

- Proposed language under 192.921(a)(1) (to require that a person “qualified by knowledge, training, and experience analyze ILI data”) is duplicative and confusing in light of existing operator qualification regulations under IM at 192.915.
- **PHMSA**: agrees that language in 192.921 regarding qualifications of persons is duplicative with existing code requirements in 192.915(b) and proposes to withdraw this duplicative language.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

NPRM Comments

- Clarify “apply one or more of the following methods for each threat to which the covered segment is susceptible.” At least 1 assessment may be required for each threat? Current proposal would virtually mandate the assessment of all nine threats. Clarify that every ILI assessment does not require a crack tool and that tools are driven by the identified threats under 192.921(a)(1) and 192.937(c)(1).
- **PHMSA:** the list of allowed methods in 192.921 does not drive which methods must be used in any particular circumstance. Selection of assessment methods is identified as part of operator’s threat assessment. If a pipeline is not susceptible to a particular threat, then the operator is not required to conduct an assessment for that threat. The proposed rule would not change that approach.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

NPRM Comments (cont'd)

- PHMSA is proposing to add requirements on the detection of anomalies which many ILI tools cannot meet. For example, hard spots, environmentally assisted cracking, and girth welds.
- **PHMSA**: The existing regulations already require an integrity assessment for all threats to which the pipe is susceptible. There is at least one assessment method considered suitable for any threat (e.g., pressure testing)



7b. Strengthened Assessment Requirements

Expand Assessment Methods Allowed for IM

192.921(a), 192.506, and Appendix F

NPRM Comments

- Supports a spike hydrostatic test only for time-dependent cracking threats such as SCC. The requirement for spike hydrostatic testing for material and construction related threats should be deleted. A pressure test to 1.25 x MAOP for Class 1 and 2 and 1.5 x MAOP for Class 3 and 4 is adequate to address those threats.
- **PHMSA:** the notation in proposed 192.921(a) (3) about spike hydro being suitable for crack defects does not require a spike hydro test in any situation; rather it merely communicates the situations where spike hydro would be suitable:
 - Any crack defect has the potential for growth during pressure testing.
 - Spike hydro is an assessment method for any crack or crack-like threats.
 - Rule would not require spike hydro exclusively to assess cracking threats.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

NPRM Comments

- Strike the language in 192.921(a)(7) regarding the no objection letter. Concerns with efficient timely reviews. Or, allow an operator to proceed with the new technology if a “no objection letter” as noticed to PHMSA is not received within 45 days prior to the plan to use other technology.
- **PHMSA**: the issuance of “no objection” letters is consistent with long-standing practice for notifications under IM.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F NPRM Comments

- Industry commenters objected to restricting direct assessment (DA) to only non-piggable line segments. However, CPUC commented that DA must always be supplemented with other methods such as ILI or pressure test. Further, NTSB urged PHMSA to ensure the regulations that result from this NPRM address all elements contained in Safety Recommendations P-15-18, P-15-20 and P-15-21 regarding upgrading lines to be piggable & prohibiting DA.
- **PHMSA:** Removing the restriction on use of DA only if line is not piggable would not be responsive to intent of NTSB recommendation.
 - DA should be considered only when better methods are impracticable.
 - PHMSA supports the NTSB goal of increasing the percentage of pipelines that are piggable and minimizing the use of DA, but believes a mandatory prohibition of the use of DA would not be cost effective.



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

Public Comments



7b. Strengthened Assessment Requirements Expand Assessment Methods Allowed for IM 192.921(a), 192.506, and Appendix F

GPAC Discussion



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

- **ISSUE:** The current regulations are silent on a number of issues that impact the quality and effectiveness of ICDA assessments
- **PHMSA PROPOSED TO:**
 - Incorporate NACE SP 0206 by reference
 - Supplement NACE standard to address issues observed by PHMSA
- **BASIS:** Petition for rulemaking submitted by NACE International dated Feb. 11, 2009



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

NPRM Comments

- Recommendations in the standard should not be mandatory.
- **PHMSA**: Recommendations in the standard are items operators should do and PHMSA seeks to codify that expectation, as applicable.
- Include reference to ASME/ANSI B31.8S (incorporated by reference, see §192.7), section 6.4, appendix B2.
- **PHMSA**: ASME B31.8S is currently referenced in 192.927, but the NACE SP 0206 is a more comprehensive standard and PHMSA believes incorporating the NACE standard will provide improved and more consistent ICDA results.



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

NPRM Comments

- Recommends that all proposed language be deleted and that ICDA be conducted in accordance with NACE SP0206-2006 with only those additional items that are currently contained in 192.927.
- **PHMSA**: proposes to supplement NACE with additional requirements to address specific issues that could adversely affect ICDA results



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

NPRM Comments

- Remove the proposed requirement to notify PHMSA 180 days before performing ICDA – clarify what is required in notification.
- **PHMSA:** notification is only required for systems with electrolyte. Since the NACE standard only applies to dry gas systems, notification (and procedure review) is important to assure appropriate controls are in place when ICDA is applied to dry gas systems that contain electrolytes.
 - This would be an “other technology” notification in accordance with 192.921(a)(4) or 192.937(c)(4) and the content of such notifications would be the same as currently required for “other technology” notifications.



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

NPRM Comments

- Remove the second half of paragraph (c) related to ICDA region identification. Using prescriptive wording requiring NACE SP0206-2006 defined DG-ICDA Regions prohibits operators from using additional criteria specific to the operator.
- **PHMSA**: The supplemental language on ICDA regions is intended to assure that each HCA within an ICDA region as defined in the NACE standard has an assessment.



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

NPRM Comments

- 192.927(c)(2) - Supports the use of pipeline specific data but there may be cases where conservative assumptions could be applied to certain, less critical data elements. Also, recommend that proposed language about model validation be deleted and current 192.927(c)(4)(ii) language be restored.
- **PHMSA**: Model validation and data validation are important aspects of a quality assessment



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

Public Comments



7c. Strengthened Assessment Requirements

ICDA

192.923(b) & 192.927

GPAC Discussion



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

- **ISSUE:** The current regulations are silent on a number of issues that impact the quality and effectiveness of SCCDA assessments
- **PHMSA PROPOSED TO:**
 - Incorporate NACE SP 0204 by reference
 - Supplement NACE standard to address issues observed by PHMSA
- **BASIS:** Petition for rulemaking submitted by NACE international dated Feb. 11, 2009



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

NPRM Comments

- NACE recommendations should not be mandatory.
- **PHMSA**: Recommendations in the standard are items operators should do and PHMSA seeks to codify that expectation, as applicable.
- Include reference to ASME/ANSI B31.8S (incorporated by reference, see 192.7), appendix A3 for susceptibility criteria.
- **PHMSA**: ASME B31.8S is currently referenced in 192.929, but the NACE SP 0204 is a much more comprehensive standard and PHMSA believes incorporating the NACE standard will provide improved and more consistent SCCDA results.



7d. Strengthened Assessment Requirements

SCCDA 192.923(c) & 192.929

NPRM Comments

- Commenter recommended that proposed language be deleted and SCCDA be conducted per NACE SP0204-2008 with only those additional items currently in 192.929, but PHMSA should not exceed those established industry standards. For example, proposed rule would require minimum of two above-ground surveys and three direct examinations. These additional requirements do not account for operators who utilize other sources of information, such as ILI runs, to compliment SCCDA results.
- **PHMSA:** proposes to supplement NACE with additional requirements to address specific issues that could adversely affect SCCDA results. Operators that desire to deviate from assessment requirements could submit an “other technology” notification to PHMSA.



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

NPRM Comments

- Provide technical guidance and clarifications.
- **PHMSA**: will communicate additional guidance as needed during rule implementation
- Recommend the requirements for SCCDA specify the assessments are required to be conducted in an area that is most likely to be subject to SCC within a compressor station discharge regardless of HCA designation.
- **PHMSA**: Assessments must address HCAs. PHMSA will consider how to structure rule to apply results from non-HCAs to HCA.



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

NPRM Comments

- Reference NACE SP0204-2008 rather than NACE RP0204-2008.
- **PHMSA**: agrees. The number of the standard will be corrected.
- Requirements for spike hydrostatic testing requirements are covered within proposed 192.506(e). There is no need to repeat these requirements in 192.929(b)(4)(ii).
- **PHMSA**: agrees that the spike hydro requirements are redundant to proposed 192.506(e) and will replace it with a reference to 192.506(e).



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

NPRM Comments

- When calculating remaining strength, until such time that the requirements within 192.607 have been met, or if the segment(s) under evaluation is not subject to the requirements under 192.607, supportable, sound engineering judgements should be allowed.
- **PHMSA**: agrees to address the gap pertaining to failure pressure calculations when data is not available.



7d. Strengthened Assessment Requirements SCCDA

192.923(c) & 192.929

Public Comments



7d. Strengthened Assessment Requirements

SCCDA

192.923(c) & 192.929

GPAC Discussion



7e. Strengthened Assessment Requirements

Guided Wave Ultrasonic Inspection

Appendix F

- **ISSUE:** The current regulations do not acknowledge guided wave ultrasonic inspection and operators currently are required to submit a notification to PHMSA to use guided wave ultrasonic inspection
- **PHMSA PROPOSED TO:**
 - Explicitly allow guided wave ultrasonic inspection in the list of integrity assessment methods
 - Codify current guidelines operators use for submitting guided wave ultrasonic inspection procedures for PHMSA review in proposed Appendix F
- **BASIS:** After many years of successful application of guided wave technology for integrity assessments, notifications are no longer necessary.



7e. Strengthened Assessment Requirements

Guided Wave Ultrasonic Inspection

Appendix F

NPRM Comments

- There are technologies other than GUL Wavemaker G3 and G4 which should not be excluded.
- **PHMSA**: does not intend to preclude the use of other equipment/software besides Guided Ultrasonics Limited (GUL) and specified in the proposed rule that operators may use equipment and software with equivalent capabilities and sensitivities.



7e. Strengthened Assessment Requirements

Guided Wave Ultrasonic Inspection

Appendix F

NPRM Comments

- The requirement of both torsional and longitudinal wave modes in all situations introduces unnecessary complexity into the GWUT data interpretation process. Specify torsional wave mode is the primary wave mode when utilizing GWUT. Longitudinal wave mode may be used as an optional, secondary mode.
- Use GWUT monitoring with a target 0.5% to 1% cross sectional area on pipes up to 36" OD, complemented with a leak monitoring system at the same location.
- **PHMSA**: The proposed rule allows operators to submit notifications to propose different technical requirements other than specified in Appendix F.



7e. Strengthened Assessment Requirements

Guided Wave Ultrasonic Inspection

Appendix F

NPRM Comments

- Numerous technical specification comments and suggestions to delete several provisions of App F
- **PHMSA**: The existing guidelines proposed to be codified in Appendix F have been successfully used since the start of integrity management.



7e. Strengthened Assessment Requirements Guided Wave Ultrasonic Inspection Appendix F Public Comments



7e. Strengthened Assessment Requirements Guided Wave Ultrasonic Inspection Appendix F GPAC Discussion



7f. Passage of Internal Inspection Devices

192.150

- **ISSUE:** The PG&E accident at San Bruno highlighted weaknesses of direct assessment which is commonly used for unpiggable pipelines.
- **PHMSA PROPOSED TO:**
 - Existing 192.150 requires that each new gas transmission line and each replacement of line pipe, valve, fitting, or other line component in a transmission line must be designed and constructed to accommodate the passage of instrumented internal inspection devices. PHMSA proposed to establish minimum technical standards for this process by incorporating NACE SP 0102, Section 7, by reference
- **BASIS:** NTSB Recommendations P-11-17, P-15-18, and P-15-20 recommended that PHMSA require that all natural gas transmission pipelines be configured so as to accommodate in-line inspection tools, with priority given to older pipelines.



7f. Passage of Internal Inspection Devices

192.150

NPRM Comments

- Recommend that PHMSA revise the proposed regulatory language to allow operators to consider the best practices in NACE's standard practice and implement those practices that are determined to be beneficial. NACE standard SP0102 should be a guidance document. Recommendations should not be mandatory.
- **PHMSA**: believes all of the recommendations in the NACE standard are beneficial to achieve the desired safety goal.



7f. Passage of Internal Inspection Devices

192.150

NPRM Comments

- Add a new exception to 192.150(b) such that a replacement of line pipe or component need not be designed and constructed to accommodate the passage of instrumented internal inspection devices if the inside of the pipeline is so obstructed by condensates or other solid materials that cannot be removed that it is very unlikely that the pipeline could ever accommodate the passage of instrumented internal inspection devices.
- **PHMSA**: Purpose of the rule is to upgrade pipelines to be piggable whenever components or pipe segments are replaced. Prior to conducting ILI the pipeline is cleaned of liquids and solids in preparation for running smart pigs.



7f. Passage of Internal Inspection Devices 192.150

Public Comments



7f. Passage of Internal Inspection Devices 192.150

GPAC Discussion



Any Questions



Thank You

16



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

165

To Protect People and the Environment From the Risks of
Hazardous Materials Transportation



16