Safety of Gas Transmission and Gathering Pipelines

RIN: 2137-AE72
Docket: PHMSA - 2011 – 0023

Gas Pipeline Advisory Committee Meeting

March 2, 2018

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, Appendix E	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), 192.624(f), Appendix A	**Discussed: Vote Postponed**
IM Clarifications; §§ 192.917 (e)(3) & (e)(4)	
Material Documentation; § 192.607	

Recap of December 14 - 15, 2017 Meetings

Topic	Result
Material Documentation; § 192.607	Vote: Passed
Strengthened Assessment Requirements (ICDA, 192.937)	
Strengthened Assessment Requirements (SCCDA, 192.939)	
Strengthened Assessment Requirements (Guided Wave Ultrasonics, Appendix F)	
Strengthened Assessment Requirements (Passage of ILI Devices, 192.150)	
MAOP Verification (192.624)	**Discussed: Vote Postponed**
Strengthened Assessment Requirements (192.493, 192.506, & 192.921(a))	

Agenda for March 2, 2018 Meeting

1. Strengthened Assessment Requirements (192.493; 192.506; 192.921(a))
2. Assessments Outside of HCAs (192.3 (MCA definition); 192.710)
3. Records (192.13(e); 192.67; 192.127; 192.205; Appendix A)
4. Repair Criteria (192.711; 192.713; 192.933; 192.485(c))

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

- Topics from March 2 meeting not concluded
- MAOP Verification (incl. MAOP records per 192.619(f) and 192.624(f))
- Other outstanding items or definitions not addressed in the technical areas, if any, not already addressed in previous meetings
- Gathering (191.23 & 191.25 (reporting); 192.8; 192.9; 192.13)

1. Strengthened Assessment Requirements
192.493; 192.506; 192.921(a)

- At the previous meeting, the Committee considered, but did not vote on three sections in the proposed rule related to strengthening assessment requirements.
  - 192.493
  - 192.506
  - 192.921(a)
- PHMSA staff will provide a brief recap of these items and summarize the committee comments and discussion.

1. Strengthened Assessment Requirements
192.493; 192.506; 192.921(a)

- **ISSUE:** To recap, the current regulations are silent on a number of issues that impact the quality and effectiveness of integrity assessments (except for a general reference to ASME B31.8S).
- **PHMSA PROPOSED TO:**
  - Incorporate by reference three industry standards in 192.493:
    - 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)

1. Strengthened Assessment Requirements 192.493; 192.506; 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)
  - Add a new section 192.506 to establish a minimum standard for conducting a "spike" hydrostatic pressure test
  - Add definitions for "*inline inspection*" and "*In-line inspection tool or instrumented internal inspection device*"
- **BASIS:** Petition for rulemaking submitted by NACE international dated Feb. 11, 2009 and NTSB recommendations

1. Strengthened Assessment Requirements Strengthen Standards for Conducting ILI 192.493

- **Committee Comments:**
- Some members commented to delete the "requirements and recommendations" language in 192.493, and other places where standards are incorporated by reference, to avoid the consequence that non-mandatory recommendations in the standards would become regulatory requirements.

1. Strengthened Assessment Requirements Strengthen Standards for Coonducting ILI 192.493

- **Based on committee discussion, PHMSA proposes the committee consider:**
  - Revise proposed 192.493 to strike the phrase "the requirements and recommendations of" to read as follows:

"*When conducting in-line inspection of pipelines required by this part, each operator must comply with ~~the requirements and recommendations of~~ [listed standards]*"

  - Make comparable change at other locations (e.g., 192.150, 192.927, 192.929) where standards are incorporated by reference.

1. Strengthened Assessment Requirements Strengthen Standards for Selection of Assessment Method 192.921(a)

- **Committee Comments:**
- Some members commented to allow DA whenever appropriate (i.e., do not restrict the use of DA to unpiggable segments or when other methods are impractical) – incorporate better language to clarify use of DA where it is appropriate to do so
- Clarify language in 192.921(a) that tools must be selected based on applicable threats (avoid the implication that every tool must always be used to assess every threat)

1. Strengthened Assessment Requirements Strengthen Standards for Selection of Assessment Method 192.921(a)

- **Committee Comments:**
- Delete requirement in 192.921(a) requiring a review of ILI results by knowledgeable individuals, since it is duplicative with existing 192.915.
- Expressed concern that all tools cannot meet the 90% tool tolerance specified in the industry standard
  - **PHMSA**: The rule would not require that every tool perform within a 90% specification, but that actual tool performance should be verified and applied when interpreting ILI data.

1. Strengthened Assessment Requirements Strengthen Standards for Selection of Assessment Method 192.921(a)

- **Committee Comments:**
- Revise proposed 192.921(a)(3) to simply reference 506 (don't list the threats for which a spike pressure test is appropriate)
  - **PHMSA**: The list of threats is not a requirement, but it does serve to communicate that a spike pressure test has limited applicability (i.e., PHMSA would not expect the use of spike test other than to address time dependent cracking threats)
- With respect to notifications, adopt same no objection letter language the committee approved for 192.607

1. Strengthened Assessment Requirements Strengthen Standards for Selection of Assessment Method 192.921(a)

- **Based on committee discussion, PHMSA proposes the committee consider:**
  - Revise the language in proposed 192.921(a)(1) to:
    - Clarify that the assessments methods are selected based on threats to which the pipeline is susceptible
    - Remove language in 921(a) that is duplicative with existing 192.915
  - Revise proposed 192.921(a)(6) to clarify that DA is allowed where appropriate but may not be used to assess threats for which the DA method is not suitable.
  - Revise proposed 192.921(a)(7) to incorporate same "no objection" language the committee approved for 192.607

1. Strengthened Assessment Requirements Spike Pressure Test Standard 192.506

- **Committee Comments:**
- Spike test to 100% SMYS (not 105%) to address dealing with elevation and test segment length more practically
- 30 minute hold time too long, recognize need to stabilize the test but minimize spike duration to avoid growing subcritical cracks
- Clarify “time dependent cracking” as the threat to be managed by spike testing.

1. Strengthened Assessment Requirements Spike Pressure Test Standard 192.506

- **Additional Industry Comments 2/9/2018:**
- Limit applicability of spike test to environmentally-related cracking such as SCC
- **PHMSA:** Spike testing is appropriate for manufacturing and construction defects such as seam flaws, or selective seam corrosion, are time dependent threats which manifest as cracks or fail in a manner comparable to cracks.

1. Strengthened Assessment Requirements Spike Pressure Test Standard 192.506

- **Additional Industry Comments 2/9/2018:**
- Allow spike test to use gas as test medium since it is allowed under 192.503(c)
- **PHMSA:** The test under 192.503 is for new or replaced pipe being placed into service and is not for discovery of defects on pipe with known or suspected threats. Testing pipe with defects using gas would be much more likely (than new pipe) to experience catastrophic failure including fire/explosion. (Note: Operators desiring to pressure test with gas could notify PHMSA on a case-by-case under the "other technology" notification or apply for a special permit.)

1. Strengthened Assessment Requirements Spike Pressure Test Standard 192.506

- **Based on committee discussion, PHMSA proposes the committee consider:**
  - Revise the spike test requirements in proposed 192.506 to:
    - Change spike pressure to a minimum of the lesser of 100% SMYS (change from 105%) or 1.5 times MAOP
    - Reduce spike hold time to a minimum of 15 minutes (from 30 minutes) after the spike pressure stabilizes
    - Revise language to refer to time dependent cracking
    - Revise proposed 192.506(g) to incorporate same no objection language the committee approved for 192.607

1. Strengthened Assessment Requirements
192.493; 192.506; 192.921(a)

Public Comments

1. Strengthened Assessment Requirements
192.493; 192.506; 192.921(a)

GPAC Discussion

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710

- **ISSUE:** Currently, non-HCA pipelines are not required to have an integrity assessment. The incident history shows that incidents with significant consequences have occurred in non-HCA locations.
- **PHMSA PROPOSED TO:**
  - Expand integrity management requirements outside HCAs by requiring integrity assessments for all Class 3 and Class 4 locations and newly defined Moderate Consequence Areas (MCAs) that are piggable.
  - Initial assessment must be performed within 15 years (operators can take credit for prior assessments that were conducted in conjunction with an HCA)
  - Reassessments every 20 years thereafter

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710

- **PHMSA PROPOSED TO (CONT.):**
  - **MCA Definition**: Area in Potential Impact Circle w/ 5+ buildings intended for human occupancy; an Occupied Site; or the right-of-way of an interstate, freeway, expressway, and other principal 4-lane arterial roadway.
  - **Occupied Site**: Areas or buildings occupied by 5 or more persons (same as Identified Site for HCAs, except that the occupancy threshold lowered from 20 to 5).
- **BASIS:** The Pipeline Act of 2011, Section 5, mandated that PHMSA evaluate whether integrity management system requirements, or elements thereof, should be expanded beyond HCAs and issue regulations accordingly.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- Widely supported by NTSB, public and safety advocates
- NTSB commented that highways should be included in the HCA definition (not MCAs).
- **PHMSA:** believes that highways are appropriate for MCAs and that it would not be cost effective to amend the HCA definition.
- Industry commented to delete occupied sites from the MCA definition based on survey concerns.
- **PHMSA:** PHMSA proposes to remove occupied sites from the MCA definition.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- Industry commented that the highway portion of the MCA definition should be tied to the paved surface and not the right-of-way and that arterial roadways should be four or more lanes (not restricted to only highways of four lanes)
- **PHMSA:** Supports adjusting the MCA criteria with respect to highways
  - Specify four or more lanes, and
  - Eliminate right-of-way language and replace with the edge of paved shoulders.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- A definition is needed for pipelines that can accommodate ILI tools.
- **PHMSA:** believes that line segments that can accommodate ILI tool is widely understood without need for further definition.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- Due to cost concerns, AGA and APGA urged PHMSA to exempt lines <30%.
- **PHMSA:** Proposes to revise the applicability to include only lines with MAOP of ≥30% SMYS. Also, this will eliminate the need for the low stress assessment method, and PHMSA proposes to strike 192.710(c)(8). [Note that the repair requirements in 192.711 and 192.713 would continue to apply to all transmission pipelines.]

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- Disagree with restricting Direct Assessment (DA) methods to only those pipelines that cannot be inspected by ILI since NACE Standards provide clear guidelines for appropriate application of DA.
- **PHMSA:** similar to PHMSA's response to Committee comments on 192.921, PHMSA proposes the Committee consider revision to clarify that DA may be used whenever appropriate, but that DA may not be used to assess threats for which DA is not suitable.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
NPRM Comments

- AGA commented to delete 192.710 in its entirety and move it to a new subpart Q.
- **PHMSA:** does not agree that a new subpart is appropriate.
- Concern about adding tool tolerance when evaluating repair criteria based solely on depth of defect
- **PHMSA:** believes tool performance should always be accounted for in identifying and characterizing anomalies.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710

- **In light of public comments received, PHMSA proposes the committee consider:**
  - Revise proposed 192.3, definition of MCA as indicated in the PHMSA response to public comments.
    - Change the highway description to remove reference to rights of way and replace with reference to the edge of the paved surface, including shoulders.
    - Clarify that highways with 4 **or more** lanes are included
    - Remove occupied sites from the definition of moderate consequence area (MCA) and delete the definition of occupied sites.

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710

- **In light of public comments received, PHMSA proposes the committee consider:**
  - Similar to Committee comments on 192.921, PHMSA proposes the Committee consider revision to 192.710(c)(6) to clarify that DA may be used whenever appropriate, but that DA may not be used to assess threats for which DA is not suitable.
  - Revise proposed 192.710(a) to apply to lines with MAOP ≥30%SMYS and
  - Strike proposed 192.710(c)(8), low stress assessment

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
Public Comments

2. Assessments Outside of HCAs
192.3 (MCA definition), 192.710
GPAC Discussion

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- **Issue:** To recap, the NTSB Investigation of the PG&E accident at San Bruno, CA identified the issue of missing records, especially records documenting MAOP.
  - PG&E conducted an immediate search for missing records in response to an urgent NTSB recommendation, and determined that many records could not be found.
  - Subsequently, a Congressional mandate required that all operators report pipeline mileage that did not have adequate records for MAOP in HCAs and Class 3 and 4 locations.

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- **BASIS:**
  - The PG&E accident at San Bruno, CA incident identified that operators lack records to verify MAOP of some pipelines they operate in HCAs.
  - Operators, in response to the Congressional mandate, reported ~5,000 miles (13% of 37,500 miles) of pipe in Class 3 & 4 locations and HCAs did not have adequate records to confirm MAOP.

3. Records

192.13(e); 192.67; 192.127; 192.205; Appendix A

- PHMSA proposed to clarify numerous records requirements.
- The Committee voted positively on records requirements proposed in 192.5(d), 192.227(c), and 192.285(e) at the June 6-7, 2017 meeting.
- Today, the Committee will take up the records requirements proposed for 192.13(e), 192.67; 192.127; 192.205; and Appendix A.
- Records requirements specific to MAOP records proposed for 192.619(f) and 192.624(f) will be taken up at the next meeting in the context of MAOP confirmation requirements.

3. Records

192.13(e); 192.67; 192.127; 192.205; Appendix A

- **PHMSA PROPOSED TO:**
  - Require that each operator must make and retain records that demonstrate compliance with Part 192 (192.13(e))
  - Summarize records required and retention periods in a new Appendix A.
  - Require that each operator of gas transmission pipelines make/retain records for:
    - Materials (192.67)
    - Pipe Design (192.127)
    - Pipeline Components (192.205)

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- **Committee Comments:**
  - Concerned about having a general records requirement in the "general duty clause" and that by doing so, the requirement would be retroactively applied and creates unintended consequences with respect to how to rectify past non-compliances.

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- **Committee Comments:**
  - Exempt small components from the requirement to have material records for components.
  - Clarify applicability to gathering and distribution operators.

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- Based on Committee discussion and comments from both the June 6-7, 2017 and December 14-15, 2017 meetings, **PHMSA proposes the committee consider the following**:
  - Withdraw the proposed addition of 192.13(e) and the summary of Part 192 records requirements in Appendix A (recommendation from June 6, 2017).
    - Neither is essential; specific records requirements are embodied within the regulatory text of specific sections within Part 192.
    - PHMSA would support a committee recommendation to publish a summary of records requirements comparable to Appendix A outside of regulatory requirements such as in an Advisory Bulletin or other guidance document to assist stakeholders in understanding the records requirements contained in Part 192.

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- Based on the Committee discussion and comments from both the June 6, 2017 and December 14-15, 2017 meetings, **PHMSA proposes the committee consider the following:**
  - Modify 192.205 (Components) to clarify that it applies to components > 2 inches nominal diameter (recommendation from June 6, 2017).

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

- Based on the Committee discussion and comments from June 6, 2017 and December 14-15, 2017 meetings, **PHMSA proposes the committee consider the following:**
  - Revise proposed 192.67 (Materials), 192.127 (Pipe Design), and 192.205 (Components) to clarify that the proposed requirements for these 3 sections are not retroactive.
    - Existing records on pre-existing P/L must be retained for life of P/L,
    - New pipelines must make and retain records for life of pipeline
    - Other sections such as 192.713, 192.619, 192.624, 192.917, 192.933, etc., would require when, and for which pipeline segments, attributes with missing records must be verified in accordance with 192.607.]
    - *As a reminder, records requirements specific to MAOP records proposed for 192.619(f) and 192.624(f) will be taken up at the March 26-28 meeting in the context of MAOP confirmation requirements.*

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

Public Comments

3. Records
192.13(e); 192.67; 192.127; 192.205; Appendix A

GPAC Discussion

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **ISSUE:** Greater assurance is needed that injurious anomalies are repaired before they can grow to sizes leading to leaks or ruptures.
- **PHMSA PROPOSED TO:**
  - Modify the repair criteria to include additional anomalies under both the "immediate" and the "one-year" conditions for HCAs.
  - Include criteria for cracks in response to NTSB P-12-3 for HL.
  - Apply the HCA criteria to non-HCAs with a tiered response time for non-immediate conditions. Defects requiring a 1-yr response in HCAs would require a 2-yr response in non-HCAs.
  - Add definitions for significant SCC, significant seam cracking, wrinkle bend, and hard spot.
- **BASIS:** Inspection experience identified weaknesses in repair decisions in response to ILI data; some injurious anomalies and defects are not identified and remediated in a timely manner commensurate with their seriousness.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Widespread support by NTSB, PST, public and safety advocates.
- When calculating safe pressure, the listed methods (e.g., RSTRENG) only apply to corrosion metal loss. Other methods should be allowed for cracks and other defects.
- **PHMSA:** Understands that predicted failure pressure (PFP) methods such as RSTRENG only apply to corrosion metal loss and would support revising the proposed rule to include other methods appropriate for cracks and other defects.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- The proposed rule should prioritize immediate conditions discovered within HCAs over those found in MCAs or Class 3 and 4 locations when discovered simultaneously.
- **PHMSA:** All immediate conditions are those where failure is imminent. Indiscriminately requiring HCAs to be prioritized ahead of non-HCAs would not always serve safety. Both 192.933 (HCAs) and 192.713 (non-HCAs) specify that operators reduce pressure until an immediate condition can be repaired as a safety measure to prevent failure before repairs are made. Operators should make prioritization decisions among multiple immediate conditions based on the circumstances and specifics of each case.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- PHMSA should clarify the discovery of the condition and "crack-like" defect as called by the ILI tool vendors.
- **PHMSA:** Discovery of anomalies is addressed in 192.933(b) and 192.710(d), and is based on the operator having adequate information, regardless of the type of defect. This is unchanged from existing 192.933(b) requirements that have been in effect since 2003.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- For discovery of conditions per 192.933, commenter requests that PHMSA include additional time for operators to submit a notification that discovery cannot be completed within 180 days of the integrity assessment (e.g., submit the notification 30 after the 180-day discovery deadline).
- **PHMSA:** believes operators should submit notification of delays in identifying conditions on or before the 180-day deadline.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Request that the effective date of 192.713 be clarified. Concerns with the repair criteria proposed in 192.713 in a retroactive section of the regulation, operators will be required to go through previous ILI assessments and apply these new criteria retroactively to pipelines that have already been assessed that met the code requirements of the time.
- **PHMSA:** does not intend that 192.713 apply retroactively. PHMSA would support clarifying the proposed rule accordingly.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- For remaining strength calculations, address data gaps as follows: 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 may be used.
- **PHMSA Response: See next slide**

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- **PHMSA:** For remaining strength calculations, material (SMYS) and pipe properties (D, t) must be known to reliably calculate the predicted failure pressure (PFP). Operators are allowed 180 days to declare discovery of a condition. In some cases, it may be necessary to acquire information needed to verify the properties if they are unknown in order to determine the PFP.

  The acquisition of data needed for performing PFP calculations has been a requirement in subpart O for HCA locations since the inception of the integrity management rule [192.917(b) which references B31.8S, Section 4]. (cont.)

Table 1 Data Elements for Prescriptive Pipeline Integrity Program

Category	Data
Attribute data	Pipe wall thickness
	Diameter
	Seam type and joint factor
	Manufacturer
	Manufacturing date
	Material properties
	Equipment properties

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- **PHMSA (cont.):** In cases where the operator does not know information needed to perform remaining strength calculations (D, t, SMYS), operators may use the procedure in 192.607 to establish the missing information. This process may be used in HCA as well as non-HCA locations. Further, operators may assume Grade A pipe (SMYS of 30,000) in cases where SMYS is not known.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Industry provided numerous detailed comments on the technical aspects of the proposed repair criteria.
- **PHMSA:** Industry commented on many of the additional repair criteria and desires to retain existing ASME B31.8S (Figure 4) repair response timelines.
  - We will summarize and go over these comments. However, to facilitate discussion, the existing and modified repair criteria are compared in the table on the following 3 slides.

4. Repair Criteria Revisions

Existing Anomaly Type HCA Only	Existing Timing HCA Only	NPRM Anomaly Type Applies to both HCA and Non-HCA	NPRM Timing Applies to both HCA and Non-HCA
Predicted Failure Pressure (PFP) ≤ 1.1 x MAOP	Immediate	PFP ≤ 1.1 x Maximum Allowable Operating Pressure (MAOP) (same for HCA, new for non-HCA)	Immediate
Dent w/Metal Loss (ML), cracking, or stress riser	Immediate	Dent w/ML, cracking, or stress riser (same)	Immediate
Any other anomaly requiring immediate action	Immediate	Any other anomaly requiring immediate action (same)	Immediate
(no current requirement)		Metal loss >80%	Immediate
		Metal loss affecting DC/LF/HF ERW/EFW seam	Immediate
		Significant SCC	Immediate
		Significant SSWC	Immediate

4. Repair Criteria Revisions (cont.)

Existing Anomaly Type HCA Only	Existing Timing HCA Only	NPRM Anomaly Type Applies to both HCA and Non-HCA	NPRM Timing Applies to both HCA and Non-HCA
Smooth dent > 6% Top side dent (TSD)	1 year	Smooth dent > 6% (TSD) (same)	1 yr (same for HCA) 2 yr (new for non-HCA)
Dent > 2% at weld	1 year	Dent > 2% at weld (same)	1 yr (same for HCA) 2 yr (new for non-HCA)
(no current requirement)		PFP ≤ 1.25 (Class 1) 1.39 (Class 2) 1.67 (Class 3) 2.00 (Class 4)	1 yr (new for HCA) 2 yr (new for non-HCA)
		General corrosion > 50%	1 yr (new for HCA) 2 yr (new for non-HCA)
		ML > 50% at crossing/circumferential/girth weld	1 yr (new for HCA) 2 yr (new for non-HCA)
		Gouge or groove > 12.5%	1 yr (new for HCA) 2 yr (new for non-HCA)
		Any indication of crack or crack-like defect that is not an immediate condition	1 yr (new for HCA) 2 yr (new for non-HCA)

4. Repair Criteria Revisions (cont.)
§§ 192.711, 192.713, 192.933

Existing Anomaly Type HCA Only	Existing Timing HCA Only	NPRM Anomaly Type Applies to both HCA and Non-HCA	NPRM Timing Applies to both HCA and Non-HCA
Bottom Side Dent (BSD) > 6%	Monitored Condition	Same for HCAs; New requirements for non-HCAs	
TSD > 6%; analysis demonstrates critical strain levels not exceeded	Monitored Condition		
Dent > 2% at weld; analysis demonstrates critical strain levels not exceeded.	Monitored Condition	Same for HCAs N/A for non-HCAs	

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Revise paragraph 192.933(d)(1)(v) to allow for fitness for service evaluation and clarify that this is specific to selective seam weld corrosion rather than general corrosion crossing the seam weld. High frequency electric resistance welded (HF-ERW) pipe is considered "ductile" and thus should not be included in this category.
- **PHMSA:** Based on incident investigation, experience, and data, PHMSA believes the proposed repair criteria is appropriate and inclusion of HF-ERW pipe seam welds in 192.933(d)(1)(v) is appropriate. See seam failure incident data on next slide.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments
Pipe Seam Failures (2010-Nov. 2017)

Pipe Seam Type	Gas Transmission Incidents Caused by Material Failure of Pipe or Weld
Flash Welded	17
Lap Welded	4
Longitudinal ERW - High Frequency	10
Longitudinal ERW - Low Frequency	15
Longitudinal ERW - Unknown Frequency	10

4. Repair Criteria Revisions

192.711, 192.713, 192.933

NPRM Comments

- Little improvement in pipeline safety by requiring digs based purely on the proposed depth of metal loss of 50% in paragraph 192.713(d)(2)(iv). Also, remove paragraph (d)(2)(v) as it appears duplicative and the criteria is already captured within paragraph (iv).
- **PHMSA:** These two criteria are not duplicative but address two types of defects and locations. The intent of (iv) is to address areas of general corrosion that has reduced the wall thickness to less than required for the MAOP. PHMSA will clarify (iv) to refer to "general corrosion" [consistent with the HL rule at 195.452(h)(4)(iii)(E)].

4. Repair Criteria Revisions

192.711, 192.713, 192.933

NPRM Comments

- Clarify what is "significant" stress corrosion cracking (SCC) in paragraph 192.933(d)(1)(vi).
- **PHMSA:** The NPRM included a definition of significant SCC in 192.3.

- Remove paragraph (d)(2) (vi) from the proposed language. It is unlikely any operator will be able to comply with this requirement.
- **PHMSA:** 192.713(d)(2)(vi) relates to gouges or grooves greater than 12.5% of pipe wall thickness. HL operators have been complying with this repair criteria since the inception of the HL IMP program.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- ASME B31.8S should be applied for remediation based decisions. However, PHMSA proposes contradictory approaches by also requiring depth based criteria (% of nominal wall thickness) in subsequent proposed revisions to the regulation. PHMSA should only reference ASME B31.8S, which is considered the best accepted practice.
- **PHMSA:** The use of B31G/RSTRENG is not applicable to metal loss >80% wt. The use of B31G/RSTRENG with B31.8S (Fig. 4.) does not assure that this limitation is observed. PHMSA explicitly added 80% wall loss criterion to assure that all such defects are repaired immediately. PHMSA also added criteria for cracking. The current repair criteria are silent on cracks and crack-like defects.

Repair Criteria Revisions

Pressure Calculations for Corrosion

- **ASME B31G and R-STRENG**
  - ASME B31G – Flow Stress = SMYS x 1.1
  - R-STRENG - Flow stress = SMYS + 10,000 psi
  - Provisions have been included for safety factors.
- ASME B31G and R-STRENG limit accepting corrosion pits to no more than 80 percent through the wall.
- SMYS = pipe specified minimum yield strength

ASME B-31.8S - 2004

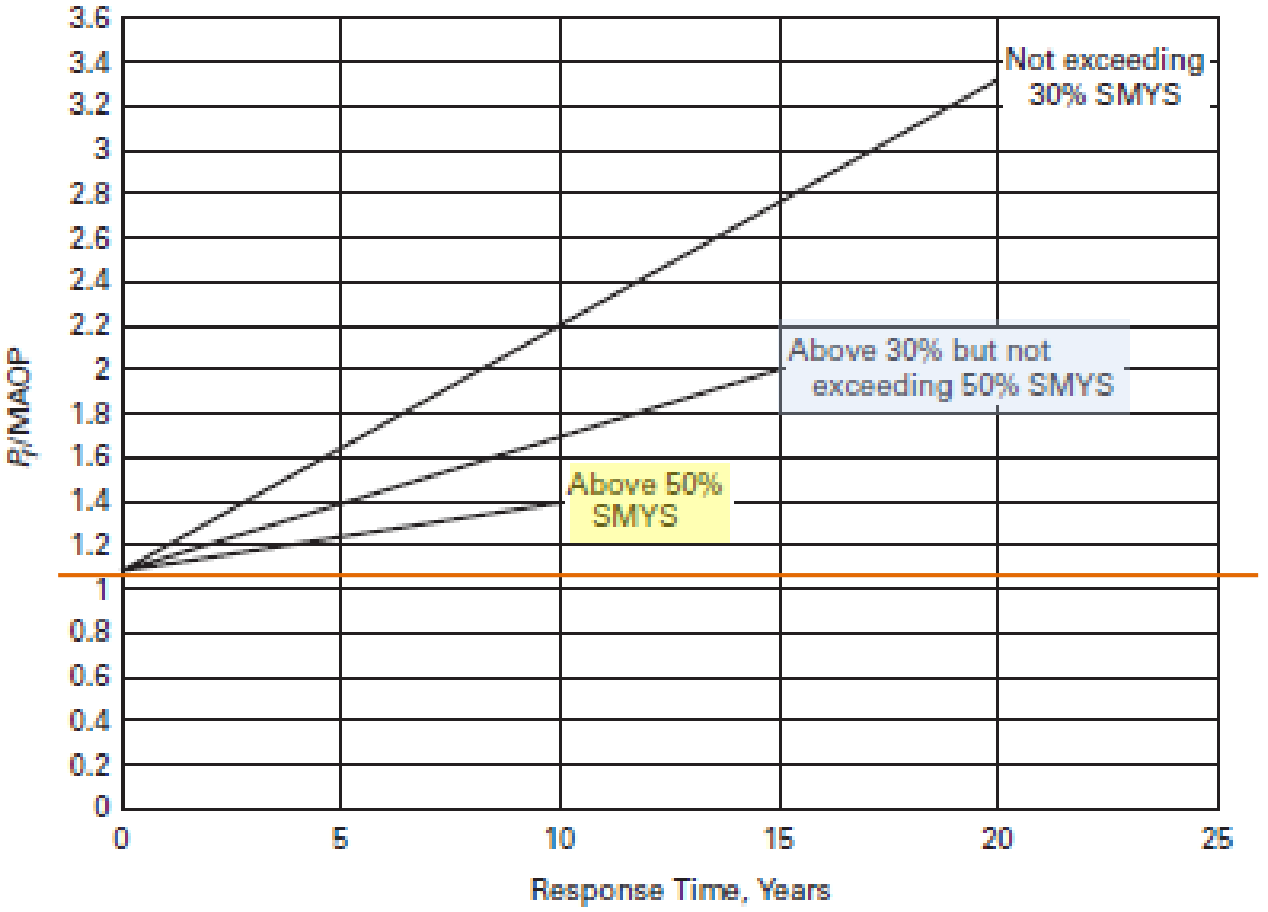
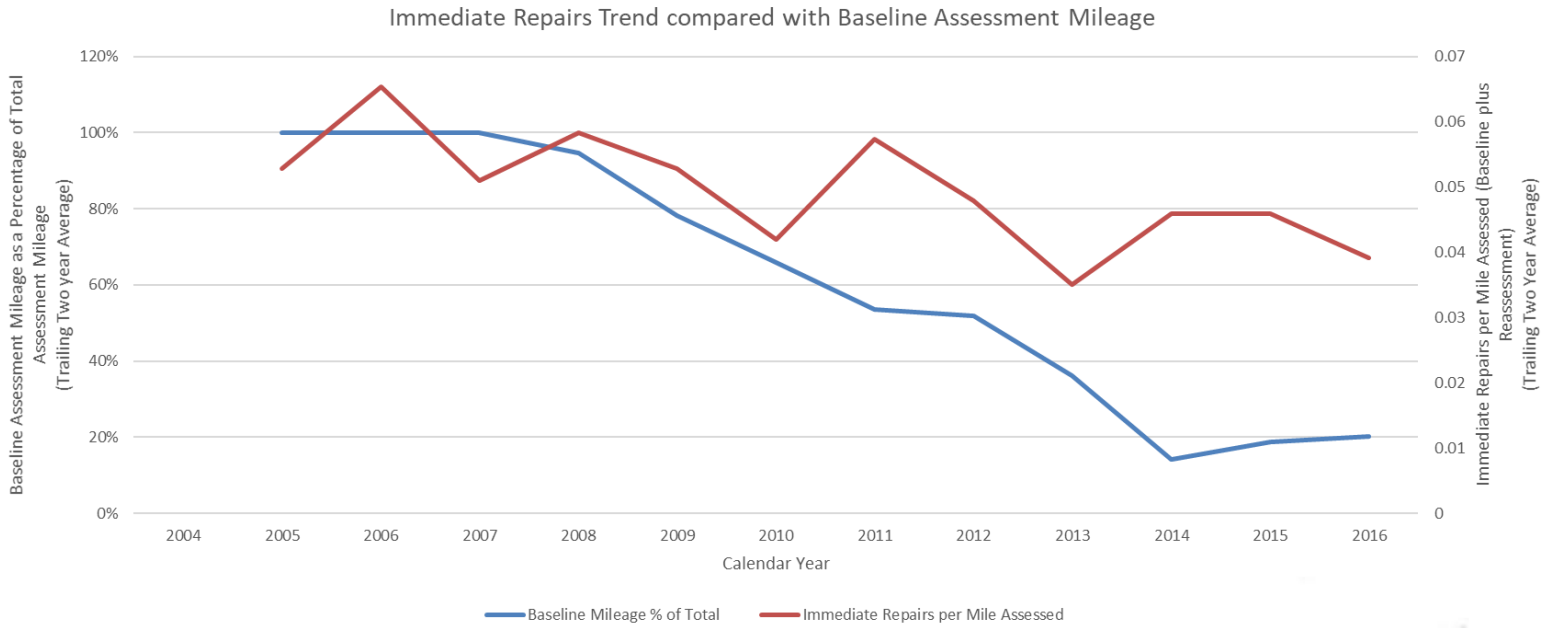


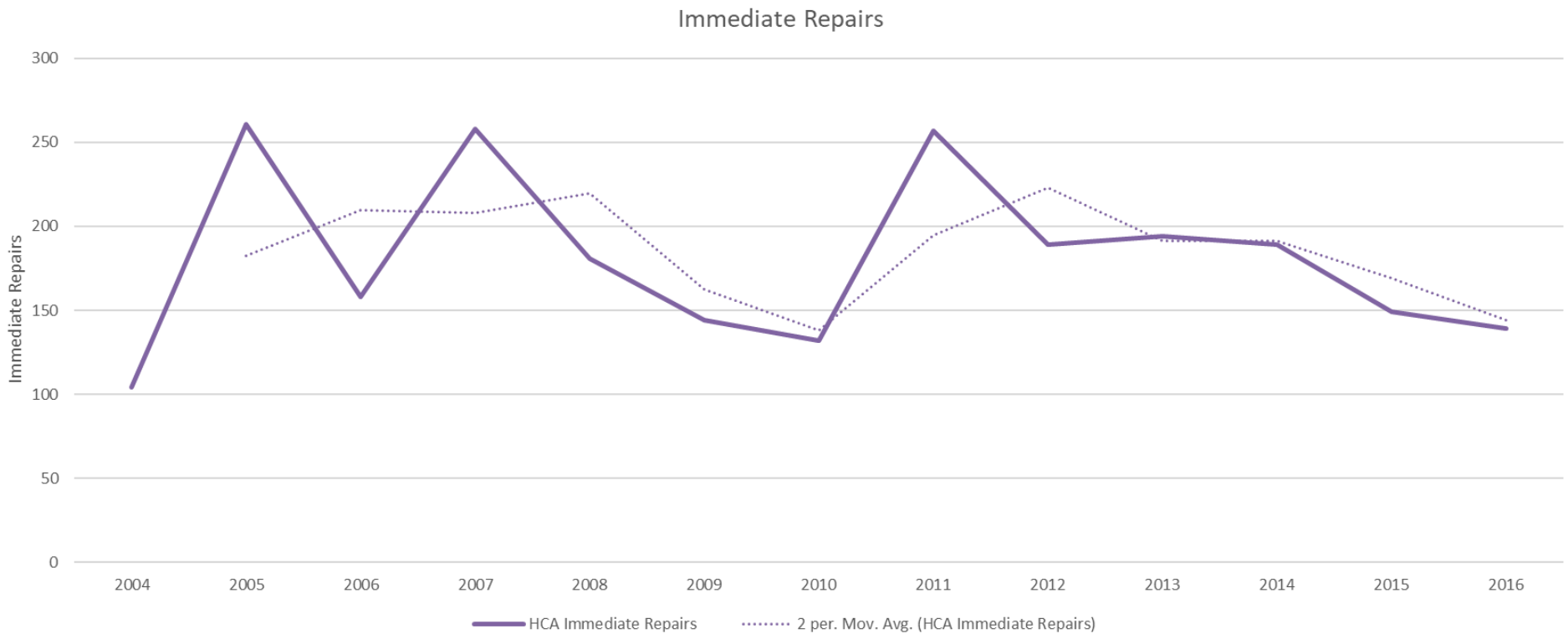
Fig. 4 Timing for Scheduled Responses: Time-Dependent Threats, Prescriptive Integrity Management Plan

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- **PHMSA** has also noted that the trend in immediate repairs has not decreased commensurate with the conclusion of the baseline assessment effort at the end of 2012.



4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments



4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Proposes adding additional criterion to 192.933(d)(2) to address significant selective seam weld corrosion (SSWC)
- **PHMSA:** Will propose criteria for SSWC.
- 192.933(d) - Recommend eliminating all places with the "any indication" language so that the presence of the condition necessitates the repairs, not just an indication. Recommend aligning the provisions of 192.933(d) with the provisions of 192.713(d).
- **PHMSA:** Proposes to revise both 192.933 and 192.713 to eliminate the phrase “any indication of” from the repair criteria language for Significant SCC, Significant SSWC, and Significant Seam Cracking.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Requirement of subsection 192.933(d)(2)(vii) to classify all cracks or crack-like defects as two-year repair conditions is overly conservative.
- **PHMSA:** Proposes to consider an alternative approach with specific crack depth criteria.
- Propose adding language to 192.933(d)(1)(ii) - A dent that has any indication of metal loss with a predicted failure pressure less than 1.5 x MAOP.
- **PHMSA:** This is out of scope of the proposed rule. PHMSA is not proposing to make changes to current code regarding criteria for dents.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- **192.933(d)(2)(vi)** - Current in-line inspection tools do not have the capability of differentiating 12.5% gouge or groove metal loss from a 12.5% external corrosion metal loss. Given current in-line inspection tool technology, operators would be required to investigate ALL metal loss indications greater than 12.5% to determine if the metal loss is a gouge or a groove. Recommend that proposed 192.713(d)(3)(vi) be deleted.
- **PHMSA:** Regardless of the type of assessment conducted (ILI, PT, DA, other), such defects are injurious and, when discovered, must be repaired in a timely manner. The HL industry has been successfully implementing this repair criteria since the inception of the HL IMP rule.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- **192.711 – 192.711(b)(1)** would require a pressure reduction to 80% of operating pressure. This requirement is not consistent with the proposed 192.713(d)(2)(i), which does allow for analysis to determine a different pressure reduction. Also, recommend the operator be required to document the analysis, assumptions used, and conclusions if the pressure reduction is something other than 80%.
- **PHMSA:** Proposes that 192.711 refer to 192.713(d)(2) for determination of pressure reduction and require that pressure reduction basis/calculations be documented.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- 192.711(a) - Suggest that temporary pressure reductions be revised under 192.711(a). Revise the section to "temporary measures" (as opposed to "temporary repairs") to be consistent with the text of the rule (to take "immediate temporary measures").
- **PHMSA:** 192.711(a) is not in the scope of the proposed rule. The temporary measures included in proposed 192.711(b) are measures such as a temporary pressure reduction to assure safety while awaiting completion of a permanent repair (not a temporary repair).

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- PHMSA should consider applicable manufacturing and tool detection tolerances in establishment of criteria that requires response to "any indication of metal loss."
- **PHMSA:** proposes to delete the "Any indication of" terminology.
- PHMSA should establish reasonable, risk-based timeframes for operators to implement repairs of anomalies that were historically identified and were repaired in accordance with the code requirements of the time.
- **PHMSA:** believes the proposed rule accomplishes this goal. The repair criteria would not become effective until the next assessment/discovery after the effective date of the rule.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Annual Report data indicates that only one repair is required for every three anomaly investigations conducted. This demonstrates the existing anomaly response criteria operators have implemented is already conservative.
- **PHMSA:** was unable to validate this assertion. In 2016, Operator Annual Report data indicated that 84% of anomalies excavated were repaired. In 2015, 82%.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Commenters support AGA's proposal that PHMSA create a new subpart, Subpart Q, specifically for the additional assessment requirements. By creating its own subpart, PHMSA would lessen concern that confusion related to applicability of the additional integrity management requirements to locations within and outside of the HCA.
- **PHMSA:** believes a new subpart is not needed. The sections applicable to repairs related to HCAs are all located in subpart O. The sections applicable to repairs in non-HCAs are located in 192.711 and 192.713. Section 192.711 explicitly points to subpart O for HCA requirements.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Recommend that SMYS confirmed by pressure test or a conservative default value such as 30,000 psi be approved for use if SMYS is unknown.
- **PHMSA:** Proposed 192.713 and 192.933 (by reference to 192.624(d)) already allows operators to assume a maximum of Grade A (30,000 psi) pipe if unknown. Presently, 192.107(b) only allows an assumption of 24,000 psi if pipe is untested.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Recommend revising requirement 192.713(d)(1)(ii) for dents with any indication of metal loss, cracking or a stress riser to differentiate between dents with associated metal loss from corrosion versus dents with mechanical damage. Propose the addition of a new monitored condition to 192.933(d)(3)(iv) A dent that has any indication of metal loss with a predicted failure pressure greater than or equal to 1.5 x MAOP.
- **PHMSA:** 192.713(d)(1)(ii) has been successfully implemented for HCAs since the inception of the Gas IMP and the HL IMP rule. The repair criteria at (d)(1)(ii) "A dent that has any indication of metal loss, cracking, or a stress riser" would apply to dents with metal loss. Distinguishing the type of metal loss in a dent (corrosion, cracks, gouges, etc.) is not reliable enough using ILI results and existing technical evaluation methodologies.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Concerned about the requirement in 192.713(d)(2)(i) that would require the operator to use the design factor for the Class Location in which the affected pipeline is located when calculating the necessary pressure reduction. This requirement is overly conservative and unwarranted.
- **PHMSA:** has retained the long-standing practice of reducing pressure to 80% of actual operating pressure, or the calculated safe pressure using B31G/RSTRENG. This is consistent with existing IMP requirement at 192.933(a)(1). PHMSA would propose to clarify the language to not imply that the lower of the two must be used.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- Suggests that PHMSA mirror 192.933(a)(1) and (a)(2) in either 192.713, or industry's proposed Subpart Q. This will provide regulatory clarity for operators that are unable to respond within the time limits for certain conditions described in this section or operators that need to take long-term pressure reductions on a pipeline.
- **PHMSA:** considered that additional notification/ reporting requirements for non-HCA repairs were not necessary. Expanding the scope of the rule to include additional reporting requirements for non-HCAs would have to be analyzed and justified.

4. Repair Criteria Revisions
192.711, 192.713, 192.933
NPRM Comments

- For PFP calculations, recommends that absent TVC material records, operators be allowed to use material properties of record until material properties are determined and documented per 192.607. Operators should be able to utilize their knowledge of their system for establishing pipe grade rather than automatically assuming Grade A pipe.
- **PHMSA:** As demonstrated at San Bruno, operator knowledge, absent TVC records, is not completely reliable. The proposed rule would allow operators to establish material properties by 192.607, or conservatively assume Grade A or lower pipe.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Material attributes should be limited to those pipe parameters that are required to be known in order to establish the MAOP of a pipeline (i.e., diameter, wall thickness, pipe grade (SMYS) and longitudinal joint factor).
- **PHMSA:** The proposed rule clearly requires: "Pipe and material properties used in remaining strength calculations and the pressure calculations made under this paragraph must be documented …." No other material attributes are specified other than those needed for this purpose.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Remaining strength calculations should not be limited to defects of 80% or less of wall thickness.
- **PHMSA:** As already stated in the existing regulations at 192.485(c), the procedures for estimating the remaining strength of pipelines with metal loss defects are "subject to the limitations prescribed in the procedures." The 80% wall loss limitation is already in full force and effect in the existing regulations because of the limitation prescribed in B31G and RSTRENG. PHMSA proposes to explicitly list that limitation in the text of Part 192 because some operators are not observing that limitation.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Recommends that SMYS confirmed by pressure test or a conservative default value such as 30,000 psi be approved for use if SMYS is unknown – others proposed a value of 24,000 psi.
- **PHMSA:** That is PHMSA's intent, and is consistent with the proposed repair criteria in 192.713 and engineering critical assessment under proposed 192.624. PHMSA proposes to more explicitly clarify that a default SMYS value (Grade A) may be used when not known.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Concerns with timeframes for compliance.
- **PHMSA:** Believes operators should perform credible analyses to determine a reliable predicted failure pressure for defects, consistent with other provisions of the proposed rule.
- Provide additional established analytical methods, consistent other Part 192 allowances for equivalent methodologies (e.g., existing §192.112, §192.907, and NPRM proposed §192.713(d)(1)(i)).
- **PHMSA:** Proposes to include reference to the new proposed rule language on fracture mechanics process.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Recognize that gouges and scrapes are metal loss defects that can be smoothed by grinding to eliminate stress concentrations.
- **PHMSA:** Part 192 does not address repair techniques or processes. Existing 192.711 requires that operators make permanent repairs.
- Gas gathering should be excluded from this requirement.
- **PHMSA:** PHMSA did not intend that this requirement apply to gas gathering lines and will assure this point is clarified in the final rule.

192.485(c)
Adds requirements for pressure reduction / pipe replacement calculations when corrosion has been identified on gas transmission lines.

NPRM Comments:

- Until TVC records are available, permit sound engineering judgement.
- **PHMSA:** Required parameters may be verified in accordance with proposed 192.607, which provides a process to acquire missing information during repairs/excavations. As mentioned previously, operators may use SMYS for Grade A pipe if SMYS is unknown.

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**

- Revise 192.711(b) to:
  - To avoid duplication, refer to 192.713(d)(2) to determine the amount of the pressure reductions, and
  - Require that operators document and keep records of the calculations or decisions used to determine the reduced operating pressure, and the implementation of the actual reduced operating pressure for a period of five years after the pipeline has been repaired (i.e., five years after the need for the pressure reduction has been alleviated).

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**
- Adding requirements for determining predicted failure pressure (PFP) of crack-like defects using the fracture mechanics procedure developed for Engineering Critical Assessment (ECA) which is applicable to cracks and other non-corrosion defects.
- Add an effective date to 192.711(b)(1) to clarify that 192.713 is not retroactive.
- Clarify 192.713(d)(2)(iv) to refer to "general corrosion" [consistent with the Hazardous Liquid (HL) rule at 195.452(h)(4)(iii)(E)].

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**
  - Add a definition for significant selective seam weld corrosion comparable to Significant Stress Corrosion Cracking:

    Significant Selective Seam Weld Corrosion means a selective seam weld corrosion (SSWC) anomaly in which the deepest selectively corroded area is greater than 10% of the wall thickness and the total length of the anomaly is equal to or greater than 75% of the critical length of a 50% through-wall flaw that would fail at a failure pressure less than or equal to 110% of SMYS, as determined in accordance with fracture mechanics failure pressure evaluation method for the failure mode using conservative Charpy energy values of the crack-related conditions.

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**
  - Add significant selective seam weld corrosion to the repair criteria.
  - Delete the phrase "any indication of" from the repair criteria related to significant stress corrosion cracking, significant selective seam weld corrosion and significant seam cracking.
  - Consider combining the repair criteria for these three conditions into one more general repair criterion for time-dependent cracking.

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**

- For significant stress corrosion cracking, significant selective seam weld corrosion and significant seam cracking, add an alternative criterion which operators may use to repair those types of defects. A proposed alternative is provided on the next slide.

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**
- Alternative Cracking Criterion:
  - (A) Crack depth plus corrosion > 50% of pipe wall thickness; or
  - (B) Crack depth plus any corrosion is greater than the inspection tool's maximum measurable depth; or
  - (C) The crack anomaly is determined to have (or will have prior to the next assessment) a predicted failure pressure (determined in accordance with the ECA fracture mechanics procedure) that is less than 125% of the MAOP for immediate conditions and 139% of MAOP for 1yr/2yr conditions.

– Operators would be allowed to use either the definition contained in 192.3 for significant cracking or the above alternative.

4. Repair Criteria Revisions
192.711, 192.713, 192.933

- **In light of public comments received on the NPRM, PHMSA proposes the committee consider:**
  - Accept the definition of "*hard spot*" with minor edits per NPRM comments:
    - *Hard spot* means an area on steel pipe material with a minimum dimension greater than two inches (50.8 mm) in any direction and hardness greater than or equal to Rockwell 35 HRC (Brin~~n~~ell 327 HB or Vickers 345 HV10).

4. Repair Criteria Revisions
192.711, 192.713, 192.933

Public Comments

4. Repair Criteria Revisions
192.711, 192.713, 192.933

GPAC Discussion

Any Questions

Thank You