



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



# PHMSA Regulatory Perspective



## Composite Repair Considerations Composite Repair Users Group Workshop September 11, 2014

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# Presentation Overview

- Pipeline Regulations Review and History
- Code References and History Applicable to Composite Repair
- Guidance and Expectations
- Field Perspective and Issues Observed by PHMSA
- Considerations for ASME PCC-2



# Code Language

- Available publicly through Electronic Code of Federal Regulations (E-CFR): <http://www.ecfr.gov>
- For PHMSA
  - Go to Title 49 – Transportation
  - Click on Parts 178-199 Pipeline and Hazardous Materials Safety Administration, Department of Transportation
  - PHMSA Pipeline is in 190-199: Part 192 Gas; Part 195 Hazardous Liquids
- States have to adopt the Federal code at a minimum, but can be more stringent. If jurisdictional to State, beware of State specific requirements.



# Use of Standards Incorporated by Reference

- Consensus based standards play a key role in our regulations and can be incorporated whole or in part
- Certain standards such as the 1966 edition of B31.4 served as a basis for Part 195. The 1968 edition of the B31.8 Code and specifications included within helped serve as a basis of Part 192 and Appendix B "Qualification of Pipe."
- Currently 64 documents incorporated by reference in 49 CFR Parts 192, 193, and 195. Updated versions of many of these or new standards being considered as we speak. PHMSA has reps on most committees, and considers new or updated standards regularly.



# Standards Incorporated by Reference

- Legal effect of incorporation by reference: This material, like any other properly issued rule or code revision, has the force and effect of law
- Any considerations for new or updated standards has to go through rulemaking process just like any code revision.
  - In some cases, incorporating a straight is fairly straight forward and non-controversial
  - In other cases, not so straightforward if there are issues in the standard PHMSA or others don't agree with



# Composite repair history and applicability to code

- Composite repair used for decades
- Prior to 1999, special permits and state waivers required
  - Certain products were previously allowed through special permits specific to project(s) identified in special permit request and subject to conditions
  - Continues to be some confusion that these products were allowed and continue to be allowed for all projects regardless of code (not true)
- After 1999 amendments, code now takes precedence and those SPs expired.
  - Everyone plays by same rules today. Any product can be considered without special permit if it meets the performance based requirements of the code and any applicable standards incorporated by reference in the code.



# Code References and Performance Based Requirements

Repaired or repair the pipe **“by a method that reliable engineering tests and analyses show can permanently restore the serviceability of the pipe”**

- § 192.309 Repair of steel pipe
- § 192.485 Remedial measures: Transmission lines
- § 192.487 Remedial measures: Distribution lines other than cast iron or ductile iron lines
- § 192.713 Transmission lines: Permanent field repair of imperfections and damages
- § 195.585 What must I do to correct corroded pipe



# Guidance and Expectations

- Some information on general expectations in
  - The preambles of NPRM and Final Rule for 1999 amendments
  - Interpretation Nov 18, 2010
- If used, we would expect the operators to do an adequate job selecting the right materials/methods for their operations, which would include getting appropriate testing data, etc.





# Preamble language

- More language of guidance/intent in preamble:  
Search via [www.regulations.gov](http://www.regulations.gov) or just google the following
- 16884 Federal Register / Vol. 64, No. 66 / Wednesday, April 7, 1999 / Proposed Rules
  - Proposed Rule [Docket No. RSPA–98–4733; Notice 1]
- 69660 Federal Register / Vol. 64, No. 239 / Tuesday, December 14, 1999 / Rules and Regulations
  - Final Rule ([Docket No. RSPA–98–4733; Amdt. 192–88; 195–68])



# Interpretation PI-10-0013 Nov 18,2010

- PHMSA Pipeline Interpretations:  
<http://www.phmsa.dot.gov/pipeline/regs/interps>
- Re pipe repairs at 49 CFR §§ 192.309(b), 192.485(a), 192.487(a), 192.713(a)(2) and 192.717(b)(5) and 49 CFR § 195.585(a)(2).
- 1. Do these regulations limit the number of discrete applications or the length of application of alternative repair systems?
- 2. Can alternative repair systems be used to increase the pressure capacity of a span of pipeline above the original maximum operating pressure in response to revised operating demands?
- 3. Can alternative repair systems be used to address the need to lower stress levels in the base pipe in response to a change in class location or other revised operating conditions?



# Interpretation PI-10-0013

## Nov 18, 2010

- 1. Do these regulations limit the number of discrete applications or the length of application of alternative repair systems?
- **Response 1:** The regulations do not prescribe a particular limit to the number of discrete applications of an alternative repair method. The engineering test data for the material to be used must clearly demonstrate that the alternative repair method will restore the original design strength of the pipe, but will also perform in the pipeline environment in which it is installed, including withstanding secondary stresses of loading, pipe movement, soil movement, and external loads, for the length of service for which it is intended. While the 1999 rule (64 FR 69660, December 14, 1999) allows alternative repair methods for individual repairs on corroded or damaged steel pipe in natural gas pipelines or corroded steel pipe in hazardous liquid pipelines where appropriate, **an operator of a pipe joint having sufficient defects should carefully consider all reliable methods of repair before installing an excessive number of alternative repairs.**



## Interp PI-10-0013 cont'd

- 2. Can alternative repair systems be used to increase the pressure capacity of a span of pipeline above the original maximum operating pressure in response to revised operating demands?
- **Response 2:** No. The regulations require pipeline operators to repair their pipelines as necessary to maintain safety and serviceability. No repair method can be used to increase the original design strength or the pressure of a segment of pipeline above the established maximum operating pressure.



# Interp PI-10-0013

- 3. Can alternative repair systems be used to address the need to lower stress levels in the base pipe in response to a change in class location or other revised operating conditions?
- **Response 3: No. A change in Class Location is not a repair issue.** The stress level and maximum operating pressure of a given section of pipe is based on the original material and design specifications, not the material used to repair the pipe. Therefore, operators must continue to follow the requirements of §§ 192.609 and 192.611 to confirm or revise the MAOP as necessary upon a change in Class Location, regardless of whether an alternative repair method was used to perform a repair.



# Compliance Review Considerations

- Does PHMSA Pipeline endorse/recommend/approve specific products?  
No. There has been some confusion in a couple areas
  - Certain products were previously allowed through special permits prior to 1999 code amendment. Code now takes precedence, and those SPs expired. Everyone plays by same rules
  - Operators expected to have listing in their Operating and Maintenance (O&M) manual of their approved methodologies for repairs that they allow for all types of defects that they repair (corrosion, cracks, dents, etc.)
    - Must include documentation showing operator (engineering) reviewed the repair methodology's test results and approved for inclusion in O&M, and reliable engineering tests and analyses show as method that can permanently restore serviceability of the pipe.
    - Inspector will review for adequacy, but does not result in explicit approval from PHMSA.



# Field Perspective

- We have heard of issues and failures, most of which are anecdotal
  - Typically not reportable at Federal level or there are multiple contributing factors. There have been more reportable incidents at State level.
- Most issues procedural in nature, such as not following appropriate procedures during installation, or operator using a method/product that's not in O&M
- Other issues we see:
  - Health and safety issues: employees who were applying the repair materials did not appear to have the proper PPE



# Max's (and some others') current list of no-nos

- Applications of composite repair on leaking pipes
  - Aware some studies being done on composite repairs that can be applied and cured underwater, but still early in development
- Application of composite repair on girth welds where there is corrosion. May be ok if appropriate testing, but in general we'd like to see that avoided if possible
- Composite repairs on defects that were cracks
  - Operator called it a temporary repair. No provisions for temporary repairs in this sense. All repairs must meet requirements to permanently restore serviceability





# Issues for continued communication

- Clear understanding and communication of potential failure modes, cyclic fatigue effects
- Consideration of interactive threats in the design and selection of repair products
- Application and consideration for more complicated installations - more aggressive dents, gouges, cracks, wrinkle bends over longer spans
- Operator Qualification
- How to inspect post installation and assess integrity
- Where is the common ground for standardization of these products, while still being sensitive to proprietary information (ASME PCC-2 may help)



# ASME PCC-2 consideration

- PHMSA actively engaged on ASME PCC-2 subgroup on non-metallic subgroup and supports the efforts of the group
- Generally considered the “go-to” standard by many and a good idea if composite repair products are able to meet PCC-2
- However, as PCC-2 is not incorporated by reference in the code currently, do not have to necessarily meet ASME PCC-2 to comply with current code.
- PHMSA supports efforts to get PCC-2 incorporated via standards like ASME B31.4 or B31.8, but defers to the standard development process in those committees
- CRUG Certification process could be a useful vehicle
- At end of day up to operator on what they’re comfortable using in their systems and up to inspectors to determine adequacy of operators’ compliance with code



# Questions



**Thank you!**  
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