



Technology Transfer Forum

Composite Wrap Repair Study

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Composite Wrap Repair Study
Houston, Texas
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Overview



- **GOM Pipeline Infrastructure**
- **Pipeline Repair Statistics**
- **Composite Repair Study 2006-2007**
- **Current BSEE Considerations**
- **Study Goals and Expectations 2015-2017**



GOM Pipeline Infrastructure

GOM Pipeline Infrastructure



- 19,515 Miles of active P/Ls
- 4,854 Active P/L Segments
- 2,328 Active Platforms
- 620 Proposed Decommissionings
- 1,528 OOS P/Ls



Pipeline Repair Statistics

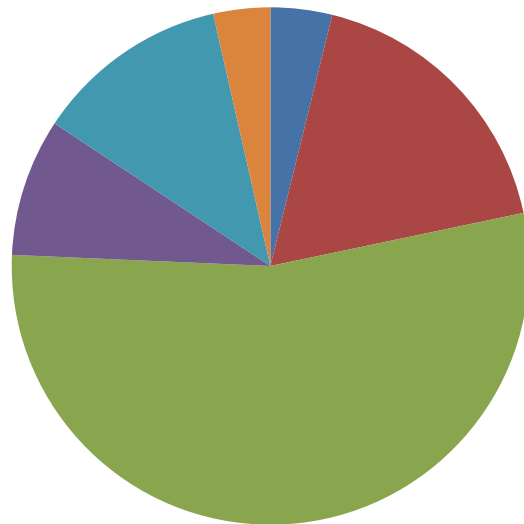
Updated 10/2015

Repair Plan Statistics Overview



- 3,068 Repair Plans have been received and approved since June 10, 2002

Composite Wrap	Clamp	Replace Damaged Pipe	Replace Entire Riser	Other	Unknown
118	548	1656	264	373	109

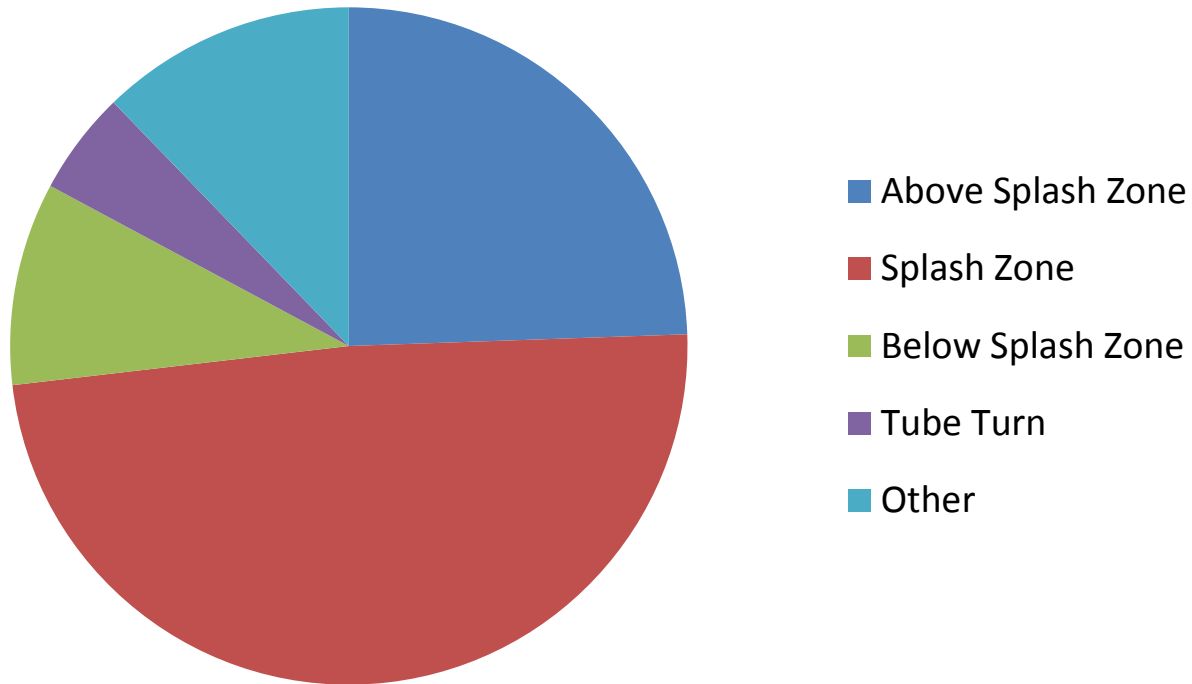


- Composite Wrap
- Clamp
- Replace Damaged Pipe
- Replace Entire Riser
- Other
- Unknown

Repair Locations



Riser Repair Locations



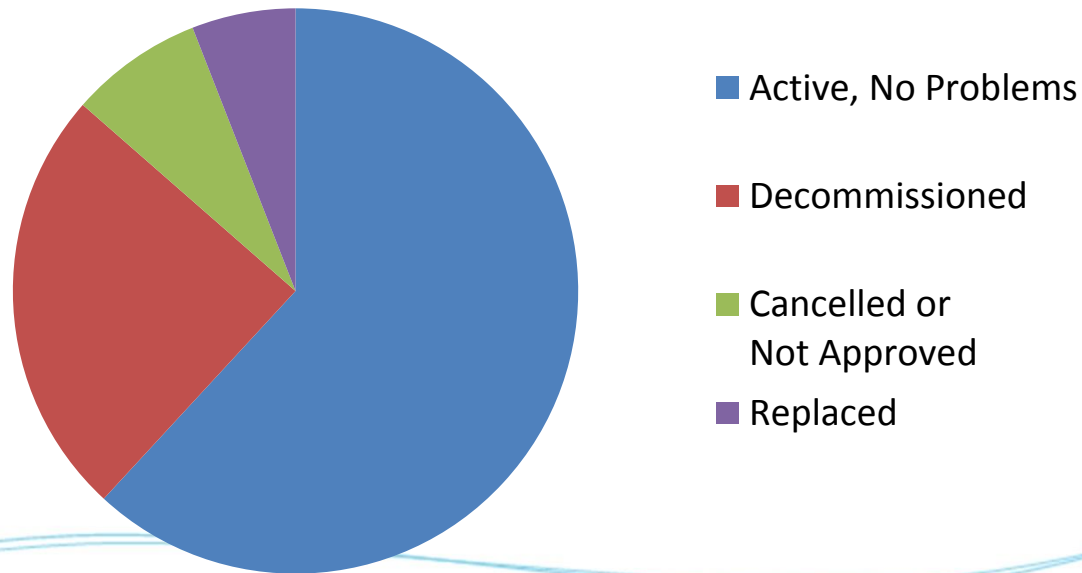
Damage Types



Composite Repair Plan Statistics



- 118 Composite Wrap Repair Plans have been received and 5 were cancelled since June 10, 2002





Composite Repair Study 2006 - 2007

Composite Repair Study 2006-2007



- Task Order 39300, MMS Project Number 558
- Authored by: Dr. Ozden O. Ochoa, Texas A&M University
Chris Alexander, Stress Engineering Services
- Final Project Report, June, 2007 entitled, “Composite Repair Methods for Steel Pipes” prepared for DOI MMS

2006-2007 Study Conclusions



Offshore risers are subjected to combined loads including internal pressure, axial tension, and bending loads, as compared to onshore repairs that primarily involve restoration of hoop strength. This necessitates a unique repair design methodology.

- Page 12, Composite Repair Methods for Steel Pipes Final Project Report (June, 2007)

“ASME has developed a document focused on the repair of pressure equipment, *PCC-2-2006 Repair of Pressure Equipment and Piping Standard* [that] provides details on how composite materials are to be used to repair pipes.....What is not specifically addressed in the ASME document is the repair of offshore pipelines and risers.”

- Page 2, Composite Repair Methods for Steel Pipes Final Project Report (June, 2007)

2006-2007 Study Conclusions



“The missing link in most of the composite repair systems is long-term test data (especially in terms of adhesive systems). For [this] reason, pipeline companies should be hesitant to define composite repairs as permanent repairs.”

- Repair of Pipelines, Piping, and Structures Using Composite Materials, Presentation by Stress Engineering Services, Inc. (February, 2008)

“A follow-on study is needed to establish repair criteria for offshore repair and should include a study of long-term performance.”

- Offshore Technology Research Center (OTRC) Presentation included in June, 2007 Final Report



Current BSEE Considerations



Composite Wrap Repair Plans Development of Perspective



- December, 2012: Change in Chief of the Pipeline Section.
- Review of the Task Order 39300, MMS Project Number 558 conducted by the Senior Staff Pipeline Engineers resulted in the following:
 - Concern for:
 - the strength of the pipeline
 - the longevity of the repair [a noted consensus among the Staff Engineers and noted in the report]
 - Limited history of composite wrap repairs on the OCS
 - Guidelines unclear
- August, 2013: Change in BSEE Pipeline Section perspective on composite wrap repairs

Composite Wrap Repair Plans

Current BSEE Considerations



- Composite wraps are only being approved for the purpose of inhibiting corrosion
- Leaks may not be repaired with composite wraps
- Approval of composite wraps for the purpose of adding material strength is not allowed

Composite Wrap Repair Plans

Current BSEE Considerations



- Maximum Allowable Operating Pressure (MAOP) must be calculated using the reduced wall thickness at the location of composite wrap repair
- Section of pipe must be replaced if:
 - Corrosion results in half-body (50%) loss or more and/or
 - Less than 0.01-inch of wall thickness remaining



Study Goals and Expectations 2015 - 2017

Composite Repair Study Goals and Expectations



- Determine the effectiveness of composite wrap repairs in an offshore environment as a long-term repair solution.
- Develop a guideline document for using composite wrap repairs on offshore pipelines and risers.
- Analyze and evaluate plastic pipeline insert technology as a method for repairing pipelines and risers.
- Could serve as the foundation for future regulation and/or policy implementation.



Thank you for your attention!
Questions

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