

MICHAEL BAKER JR., INC.



Mechanical Damage Study Outline and Overview

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Mechanical Damage Workshop
Houston, TX
February 28 – March 1, 2006

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Mechanical Damage Study – Baker's Role

- **Consensus study on how best to identify and address mechanical damage issues**
- **Phase 1 is a detailed study outline; revised following workshop**
 - Understand the issues
 - Direct the study focus
 - Solicit industry understanding and support
- **Phase 2 is the Mechanical Damage Report**
- **Opportunity for public comment on draft final report (same approach as SCC Report)**

Baker Mechanical Damage Study

Website created for public comment process:

www.BakerProjects.com/OPS



Mechanical Damage Study

Accepted public comments on:

- Mechanical Damage questions
- Dent Study
- Pipe Wrinkle Study

Baker PHMSA/OPS Homepage - Microsoft Internet Explorer provided by Michael Baker Corporation

Address: <http://www.bakerprojects.com/ops/home.asp>

Links: Home, Mech. Damage Study, Dent Study, Pipe Wrinkle Study, SCC Study, LE-ERW Seam Study, HVI Release Conso, Contact Us

Current Activities Open for Public Comment:

- Mechanical Damage Study**

Commenting Status	Open
Comment Period Starts	August 1, 2005
Comment Period Ends	January 31, 2006
Summary Information	PHMSA/OPS is seeking input to questions on Mechanical Damage
- Register for Mechanical Damage Workshop**
- Dent Study**

Commenting Status	Open
Comment Period Starts	August 1, 2005
Comment Period Ends	January 31, 2006
Summary Information	PHMSA/OPS is seeking comments on the Dent Study Final Report and its applicability to the Mechanical Damage Study Efforts
- Pipe Wrinkle Study**

Commenting Status	Open
Comment Period Starts	August 1, 2005
Comment Period Ends	January 31, 2006
Summary Information	PHMSA/OPS is seeking comments on the Pipe Wrinkle Study Final Report and its applicability to the Mechanical Damage Study Efforts

Mechanical Damage Workshop
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Mechanical Damage Study

Address: http://www.bakerprojects.com/ops/mech_dam_study.asp

Baker PHMSA Office of Pipeline Safety
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Mechanical Damage Study

Mechanical damage, resulting from both excavation activity and improper construction techniques, remains a major cause of pipeline failure and the leading source of high consequence pipeline incidents. Significant efforts by PHMSA/OPS, the pipeline industry, and stakeholder organizations have increased public awareness of the risks of excavation in pipeline corridors. However, research regarding detection of mechanical damage using in-line inspection (ILI) technologies, characterization of the severity of mechanical damage, and mitigation measures for reducing the occurrence of mechanical damage is fragmented. No single prior study has simultaneously assessed the state of knowledge of each of these considerations or their interrelationships.

Commenting Status	Open
Comment Period Starts	August 1, 2005
Comment Period Ends	January 31, 2006
Summary Information	PHMSA/OPS is seeking input to questions on Mechanical Damage

PHMSA/OPS plans to hold a major public workshop on February 28 and March 1, 2006 in Houston, TX, on mechanical damage. The workshop will help to ensure broad outreach to, and involvement by, the primary stakeholders in the development of a common frame of reference useful in advancing technology addressing mechanical damage issues. [Register for the workshop.](#)

This mechanical damage workshop is part of a broad approach devised to reduce mechanical damage incidents. The workshop will also provide input to a benchmark technical study of mechanical damage issues relating to integrity of both transmission and distribution gas and liquid pipelines, including a review of incident history, level of risk, indicators of potential for line rupture, detection methods, mitigation measures, assessment procedures, and regulatory procedures for evaluation of industrv assessments.

Using inputs from this workshop as well as from the initial study and interviews, PHMSA/OPS will commission a new major synthesis study on technology and mechanical damage (a la the recent SCC study). This second study will evaluate the state of technology as well as gaps in the accepted technology necessary to understand, identify, assess, manage, and mitigate mechanical damage of pipelines. This study will also identify any gaps in associated regulations and industry standards. This study will be structured to seek industry and stakeholder input and review as well as to allow public comment period(s). Successful completion and acceptance of this second study will require the support and participation of all stakeholders.

At this time, PHMSA/OPS, and its consultant, Michael Baker Jr., Inc., are requesting responses to a set of questions on mechanical damage issues. Input from the questions will be used to set the agenda for the workshop and provide input for the synthesis study.

In addition, PHMSA/OPS is also requesting comments on the [Dent Study Final Report](#) and the [Pipe Wrinkle Study Final Report](#), as issues presented in these reports may need to be included in the broader comprehensive study of mechanical damage.

• Respond to the questions and provide comments on the workshop and proposed study.

Link here from PHMSA Public Meeting Site

Solicited comments via website

Mechanical Damage Workshop
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MD Survey Questionnaire

- How do you define mechanical damage?
- Which source or sources of mechanical damage, such as original construction damage, excavation damage, etc., have the most significant impact on the integrity of your pipeline system and why?
- Which class or classes of mechanical damage, such as dents, gouges, dents with gouge, etc., present the greatest integrity threat to your pipeline system and why?
- Where has mechanical damage been the greatest problem?
- Which methods for screening a pipeline segment for the likelihood of mechanical damage have proven to be the most and least effective for your pipeline system?.....

Mechanical Damage Study

- **How is Mechanical Damage defined?**
 - Damage to pipe (metallic and non-metallic)
 - Caused by outside force
 - **Scrapes, scratches and gouges resulting in metal loss**
 - **Dents??**
 - **Wrinkles??**
 - Caused by movement of the surrounding soil??
 - **landslides, earthquakes, subsidence, washouts etc.**
 - Both onshore and offshore??

Mechanical Damage Study



**Was the bullet hole in TAPS
Mechanical Damage?????**



Mechanical Damage Study - Overview

- **Definition of MD**
 - Incident history
 - Subcategories and causes
- **MD Prevention**
 - Risk models (available, effective, reliable?)
 - One-call systems (what's essential?)
 - Preventative technological measures
 - Technology gaps
- **MD Detection**
 - Tool effectiveness and selection
 - Technology gaps

Mechanical Damage Study - Overview

- **MD Characterization**
 - Acceptance criteria
 - Technology gaps
 - Integrity assessment methods
- **MD Mitigation**
 - Effective methods
 - Technology gaps
- **Elements for addressing MD that a prudent operator would incorporate into its IMP**

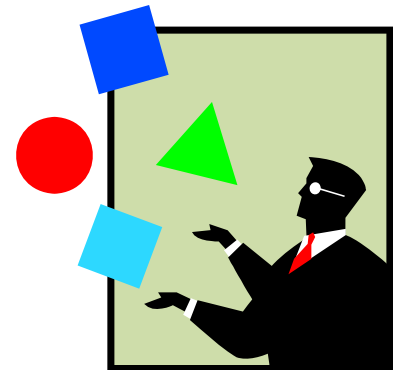
Mechanical Damage Study - Overview

- **Summary:**

- What are the gaps in technology?



- What are the priority issues?



- What are short and long-term courses of action?



Mechanical Damage Study

We're here to listen



.... learn

....and dialogue

Mechanical Damage Study – Project Team



- Keith Meyer, Ph.D., P.E. – Anchorage
- Paul Carson, P.E. – Anchorage
- Chris Mayernik, P.E. – Pittsburgh
- Wes Watkins, P.E., PMP – Houston

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