PHMSA

Informational Public Meeting

Westin Galleria
Houston, Texas

December 13 – 15, 2022

Pipeline and Hazardous Materials Safety Administration
Office of Pipeline Safety

Risk Modeling - Review

Steve Nanney – PHMSA, Sr. Technical Advisor

December 15, 2022

Overview

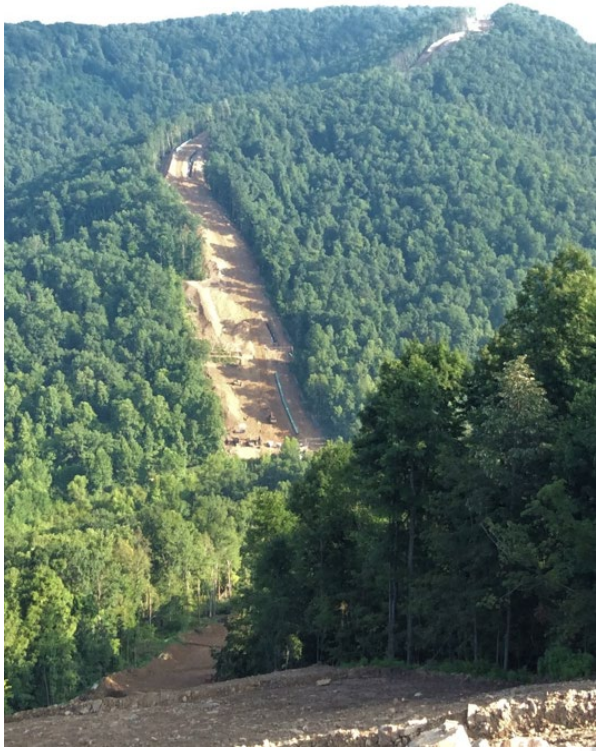
- **Spring 2023 Risk Workshop**
- **Risk Modeling**
- **2015 Risk Workshop**
- **2016 to 2017 Risk Work Group**
- **Rulemaking Impact**

Spring 2023 - Risk Workshop

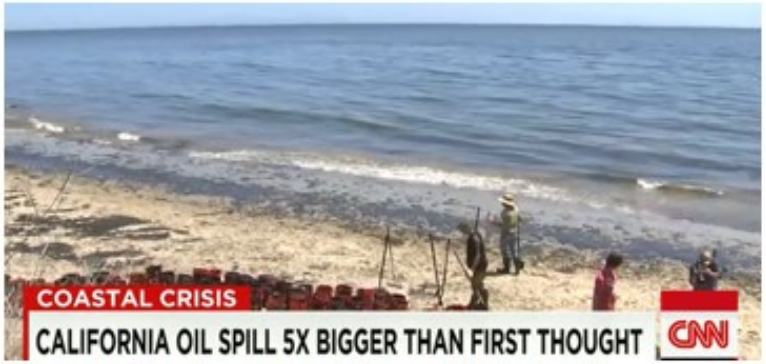
- **Spring 2023 – Risk Workshop**
  - Workshop will focus on:
    - threat identification
    - data integration,
    - interacting threats,
    - other threats that impact pipeline safety, and
    - risk modeling and analysis.
  - Incorporation of new NTSB recommendations.
  - Overall approach to risk analysis and how it is an important part of Pipeline Safety Management Systems (SMS) effort.

What is Risk Modeling?

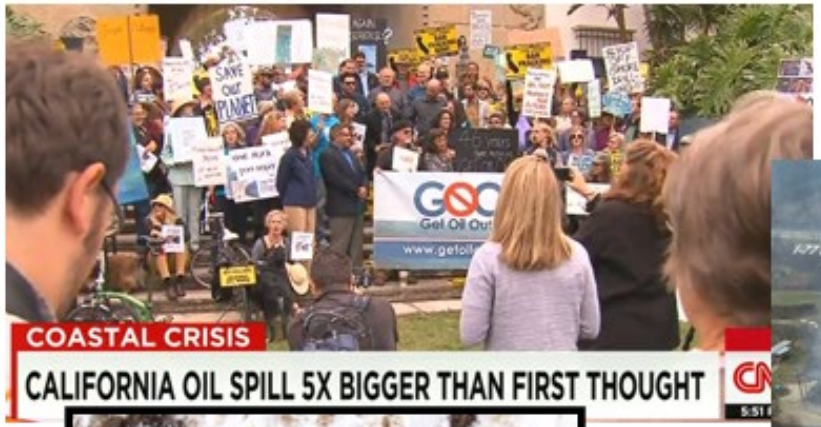
- **Threat identification**
- **Data gathering and integration**
- **Analyze integrated data through risk models to:**
  - identify the probability of failure
  - determine the potential consequences of a failure, and
  - the overall risk of failure for subject assets
- **Risk analysis**
  - Assessment intervals
  - Consideration of monitored pipeline defects
  - Preventive and mitigative measure identification and evaluation



Our World: Unremediated Threat and Result

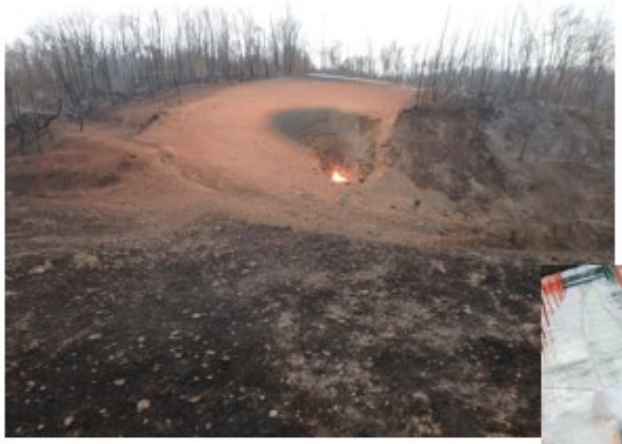


Santa Barbara, CA – 05/2015

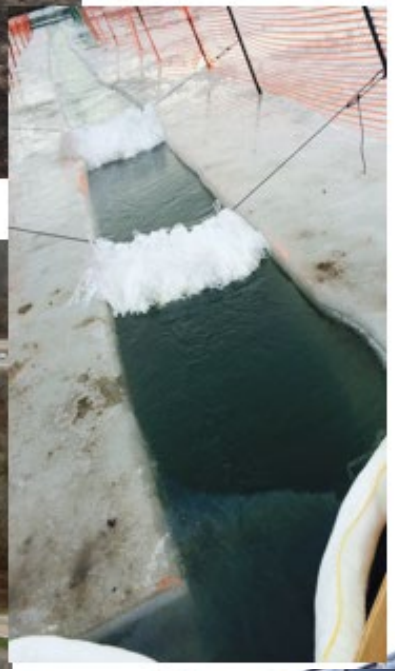


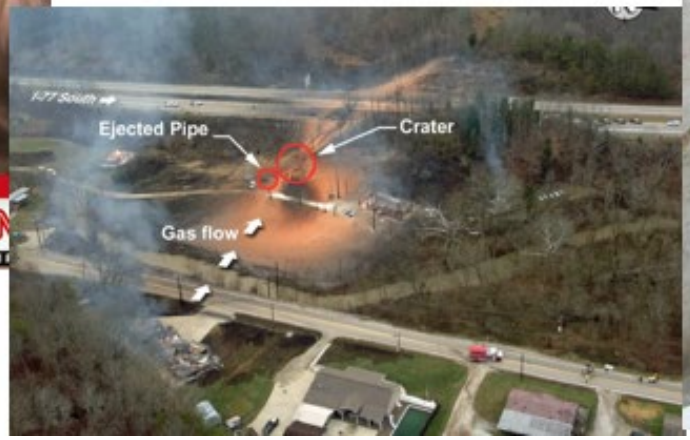
New Pipe

Fallansbee, WV 01/2015



Yellowstone River 01/2015





Sissonville, WV – 12/2012

2015 - 2017 Risk Workshops

- **2015 Pipeline Risk Modeling Public Workshop**
- **2016 - 2017 - Risk Work Group**
  - 5 Work Group review meetings held
  - PHMSA received input from a wide range of stakeholders including the pipeline industry, regulatory bodies, national labs, the public, and consultants.
- **Work Group presentations, meeting information, and report can be reviewed at:**

http://www.phmsa.dot.gov/pipeline/risk-modeling-work-group-overview

Risk Modeling Work Group – 2015-17

- **February 1, 2020, PHMSA issued a work group report**
  - "*Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation*"
- **Report was an overview of methods and tools used in risk modeling for gas and hazardous liquid pipelines:**
  - Explanation of risk modeling methods
  - Relative risk (indexing) to quantitative (probabilistic) models
  - Threats and interactive threat modeling
  - Consequence of failure modeling
  - Facilities risk modeling
  - Risk modeling data

Recent Rulemaking

Risk Modeling – 49 CFR Part 192 – Gas Rule

- **Gas Rule – establishes that gas transmission operators must:**
  - Threat Identification - Human error, such as operational or maintenance mishaps, or design and construction mistakes.
  - Address threat interaction and each unique combination must be considered at a common location
  - Consider the consequences of a pipeline failure and consider the specific impacts and consequences for each high-consequence area. Account for and compensate for uncertainties in the risk model and data feeding the model
  - Evaluate the candidate risk reduction activities, such as preventive and mitigative measures, and reduced anomaly remediation and assessment intervals.

Risk Modeling – 49 CFR Part 192 – Gas Rule – RIN 2

§§ 192.917(a) – (c)

(a) Threat Identification

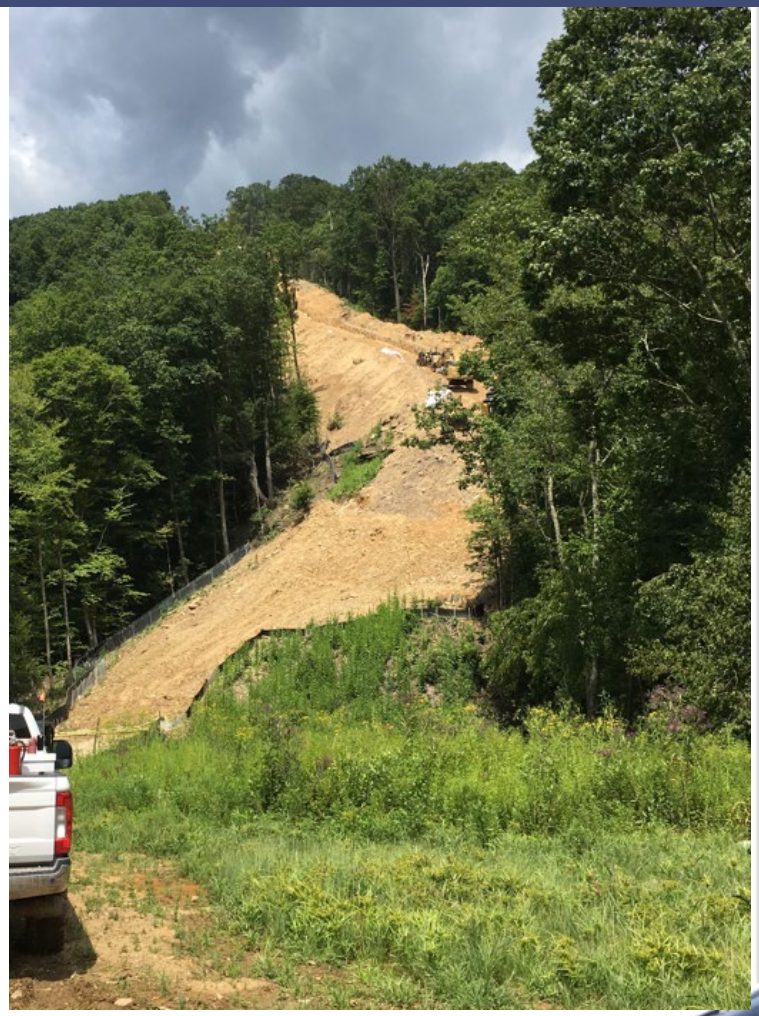
(4) Human error, such as operational or maintenance mishaps, or design and construction mistakes.

(b) Data Gathering and Integration

(c) Risk Assessment

§ 192.935(c)

(c) Additional preventive and mitigative measures for risk analysis for gas releases and protection against ruptures.



Risk Modeling – 49 CFR Part 195 – HL Rule

- **2019 Hazardous Liquids (HL) Rule:**
  - Added specificity requiring that operators integrate a defined list of attributes and **analyze** those attributes in their risk models
- **2019 HL Rule addressed the consequence of failure modeling with the requirement that operators:**
  - Conduct analysis beyond HCA analysis, and
  - Determine how a failure would impact HCAs
- **Rule making requires that operators:**
  - Identify and analyze spatial relationships among anomalous conditions (e.g., corrosion coincident with foreign line crossings; evidence of pipeline damage where aerial photography shows evidence of encroachment).

Risk Modeling – 49 CFR Part 195 – HL Rule

§ 195.452(e) Risk Factors for Establishing an Assessment Sch.

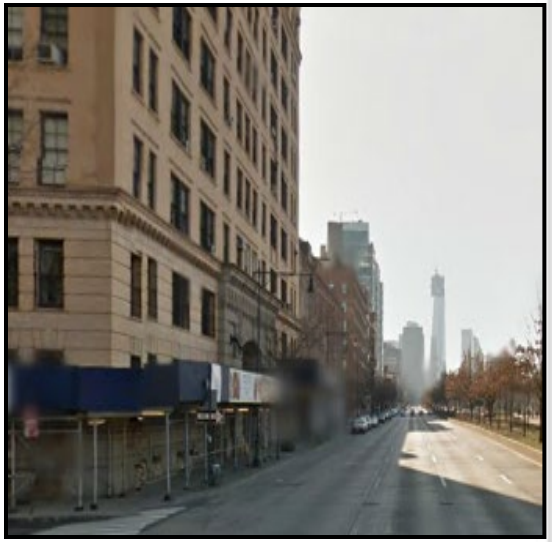
- Local environmental factors that could affect the pipeline (e.g., seismicity, corrosivity of soil, subsidence, climatic)

§ 195.452(g)

- Analysis of all available information and the consequences of a failure
- All attributes must be integrated by October 1, 2022

§§ 195.452(i)(2), (i)(3), (i)(4)

- Identifying the need for additional preventive and mitigative measures
- Leak Detection
- Emergency Flow Restricting Devices (EFRD)



Spring 2023 – Risk Workshop

Spring 2023 - Risk Workshop

- **Spring 2023 – Risk Workshop**
  - Workshop will focus on risk modeling and the analysis, data integration, interacting threats and other threats that impact pipeline safety.
  - Incorporation of new NTSB recommendations.
  - Other topics to improve the overall approach for risk analysis to improve pipeline safety.

Please provide your thoughts and ideas for this upcoming Workshop

Spring 2023 - Risk Workshop - Topics

- **How Can I Provide "Topics" for the 2023 Risk Workshop Agenda?**
- Visit: https://www.regulations.gov
- Type **Docket No. PHMSA-2022-0161** into the search feature and leave comment identifying "2023 Risk Workshop – Topics" the topics you believe should be discussed.
- Or
- **Return to where you registered for this conference:** https://primis.phmsa.dot.gov/meetings/MtgHome.mtg?mtg=161
- Follow instructions for mailing comments

PHMSA
Pipeline and Hazardous Materials Safety Administration

Thank You

Steve Nanney – PHMSA
steve.nanney@dot.gov