# PHMSA Pipeline Risk Modeling Methodologies Public Workshop

# Path Forward

**PHMSA – Office of Pipeline Safety**

**Alan Mayberry**

**September 10, 2015**



# Workshop Summary

- **Thank you for your participation**
  - **Attendance: In-person and via the web**
  - **Presentations**
  - **Questions**





# Session Speakers

- **Christopher Hart – NTSB – Chairman**
- **Iain Colquhoun -** National Energy Board (Canada)
  - NEB utilizes an internal relative risk model for inspection prioritization
  - Have applied quantitative risk analysis (QRA) on a non-mandatory basis for specific safety equivalent evaluations
- **Steve Allen -** National Association of Pipeline Safety Representatives - Indiana Utility Regulatory Commission
  - Data quality: operators must know their system
  - Models must reflect changing system conditions



# Session Speakers

- **Jay Scribner-** Boardwalk Pipeline Partners
  - DRIP model (drivers resistors, indicators, preventers); apply on a dynamic segment basis
  - Utilize a central data model that all personnel engage
- **Sara Gosman -** University of Arkansas School of Law
  - Expected decline in significant incidents in high-consequence areas not seen
  - Expected decline in social costs from incidents not observed
  - Public continues to be concerned about pipeline safety





# New PHMSA Research Projects

- **Susan Rose** – Kiefner/ApplusRTD
  - Risk tolerability practices of pipeline companies / other industries, government agencies, and countries as a basis for risk model comparison and guidance
- **Jason Skow** - C-FER Technologies
  - Create guidelines for assessing and developing quantitative pipeline risk models
- **Ernest Lever** - Gas Technology Institute
  - Critical and structured review of risk approaches for preventing catastrophic events, both within and outside the natural gas industry



# Non-Pipeline Regulatory Risk Requirements and Approaches

- **Bob Youngblood** - Idaho National Laboratory
  - Survey of non-pipeline modeling techniques applied (DOE, NASA, NRC); data needs, and interpretation of risk analysis results
- **Pranab Samanta** - Brookhaven National Laboratory
  - Order of magnitude may be sufficient for some standardized risk-informed evaluation tools
- **Natasha Balac** - University of California at San Diego
  - Big data (is predicting your future...)
  - Potential to predict aspects of pipeline risk by applying data analytic tools





# Risk Modeling Methodologies

- **Ken Oliphant -** JANA Corporation
  - Using power law distributions to model pipeline accident consequences.
  - San Bruno was not a highly improbable event
- **Oliver Moghissi -** DNV GL North America Oil & Gas
  - Bayesian methods for pipeline risk analysis (future behavior based on updating past performance with present information)
- **David Merte -** NYSEARCH/Northeast Gas Association
  - Developed quantitative interacting threats risk model





# Risk Modeling Methodologies

- **Scott Randall -** Global Business Management Consultants
  - Common risk tools are poor at communication; barrier-based approach is one approach to this challenge
  - Human factors are important to understanding risk
- **Mark Stephens -** C-FER Technologies
  - Structural reliability methods (probability of failure distributions)
  - Uncertainties are important to consider
- **Andrew Kendrick -** Kendrick Consulting LLC
  - No one best approach for risk evaluation; depends on application; subject matter expert results review important
  - Data collection very important, need to do more





# Going Forward

- **Improvements to the modeling of pipeline risk are critical for successful integrity management and improved safety performance.**





# Going Forward

- Address related NTSB recommendations
- Evaluate input from this Workshop
- Region – inspection enhancements
- Risk Assessment Methodology
  - Work Group
  - Technical Guidance





811 Know what's below. Call before you dig.

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

# Thank You

**Alan Mayberry**

**US DOT / PHMSA**