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

PHMSA Your Safety Our Mission

The "Risk Modeling Work Group"

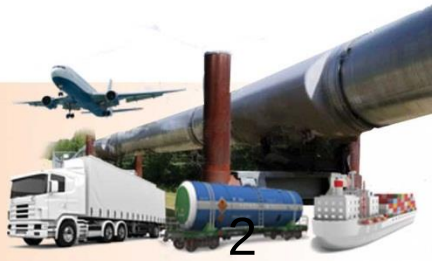
Discussion of Interactive Threats

Risk Model Work Group

http://primis.phmsa.dot.gov/rmwg/index.htm

Interactive Threats

- Topics for Discussion
  - PHMSA experience with handling interactive threats
  - NYSEARCH Final Report No. 15-060 - for the RMWG's internal use only. Not for external distribution
  - Discussion



DIMP 2013 - Interactive Threats

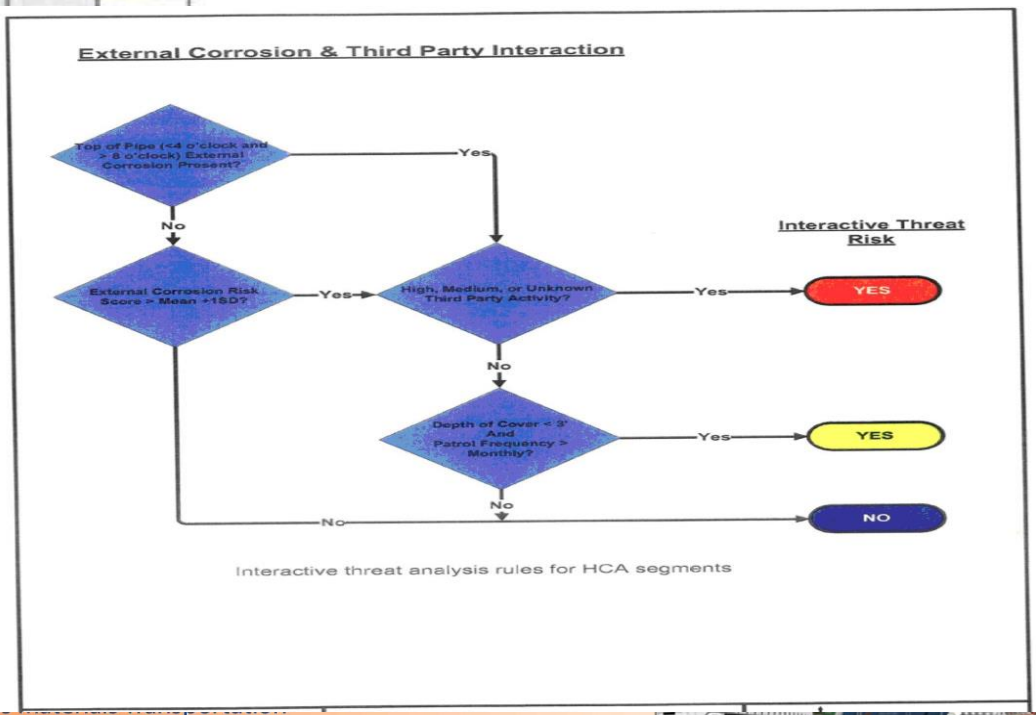
- Interact – To act on each other
- Interactive Threats - Two or more threats acting on a pipeline or pipeline segment that increase the probability of failure to a level that significantly greater than the effects of the individual threats acting alone.

- The concept of interactive threats and how to address them has perplexed many operators.
- One transmission operator created a matrix of susceptibility for each combination of the B31.8S threats along with decision flow process for each set of credible interactive threats.

DIMP 2013 - Interactive Threats

Threat Acting on Threat Present

Threat Present	EC	TP	IC	WOF	CONS	MFG	EQ	IO	SCC
EC	--	YES	NO	YES	YES	YES	YES	YES	YES
TP	YES	--	NO	YES	YES	YES	NO	YES	YES
IC	NO	NO	--	YES	NO	YES	YES	YES	NO
WOF	YES	YES	YES	--	YES	YES	NO	NO	YES
CONS	YES	YES	NO	YES	--	NO	NO	NO	YES
MFG	YES	YES	YES	YES	NO	--	YES	YES	NO
EQ	YES	NO	YES	NO	NO	YES	--	NO	YES
IO	YES	YES	YES	NO	NO	YES	NO	--	YES
SCC	YES	YES	NO	YES	YES	NO	YES		



Interactive threat analysis rules for HCA segments

DIMP 2013 - Interactive Threats

- Distribution Operators should look to their Leak and Incident history and Operations and Maintenance history to identify interactive threats specific to their system.
- Examples of interacting threats to consider include:
  - Slow crack growth in older plastics where pipeline was pinched during operational event or where over-squeeze occurred due to improper tools or procedure
  - Slow crack growth in older plastics where non-modern construction practices were used
  - Water main leakage areas or areas of soil subsidence with cast iron mains
  - Installation of mechanical fittings without restraint (category 2 & 3) in soils or conditions (excavation damage) that cause pipe to pull out of fitting

NYSEARCH Final Report No. 15-060

- NYSEARCH graciously offered a edited copy of their work for the RMWG's internal use.

Final Report

Development of a Methodology for Incorporating Interacting Threats into Relative Risk Ranking Models - Online Version

W.G. Morris, J.D. Mackenzie, H.H. Haines, and J.F. Kiefner
June 25, 2015

NYSEARCH Final Report No. 15-060

- Intent is to provide a methodology for including threat interactions in a relative risk model such as the Kiefner / NGA model in a quantitative manner.
- Structured approach is used to document process and is similar to want PHMSA has seen in IM inspections.
- Supports implementation of a interactive threat analysis in a qualitative manner

Discussion