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Board



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The National Energy Board

PHMSA Workshop

National Regulatory Perspectives on Pipeline
Cracking Challenges

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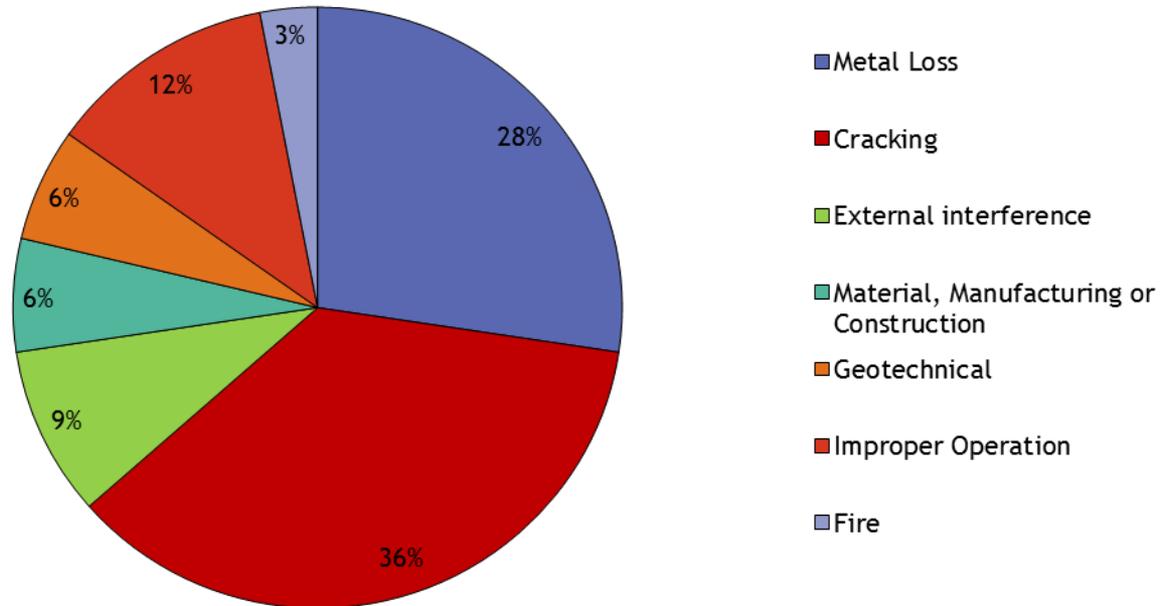
Note

The views, judgments, opinions and recommendations expressed in this session do not necessarily reflect those of the National Energy Board, its Chairman or members, nor is the Board obligated to adopt any of them.



From NEB Rupture Data:

NEB Regulated Pipeline Ruptures 1992-2012 Causes

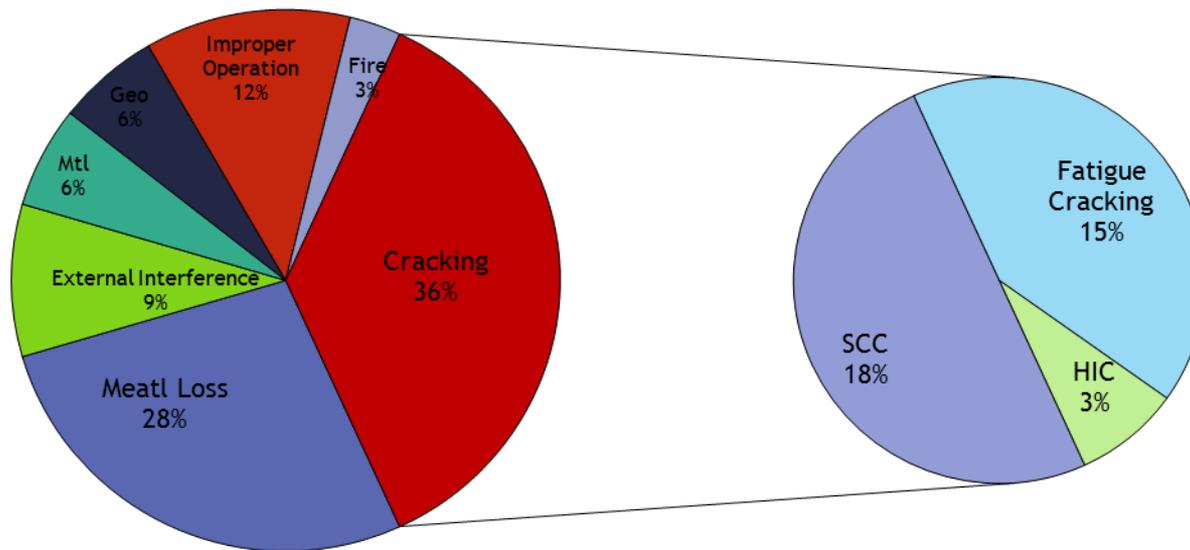


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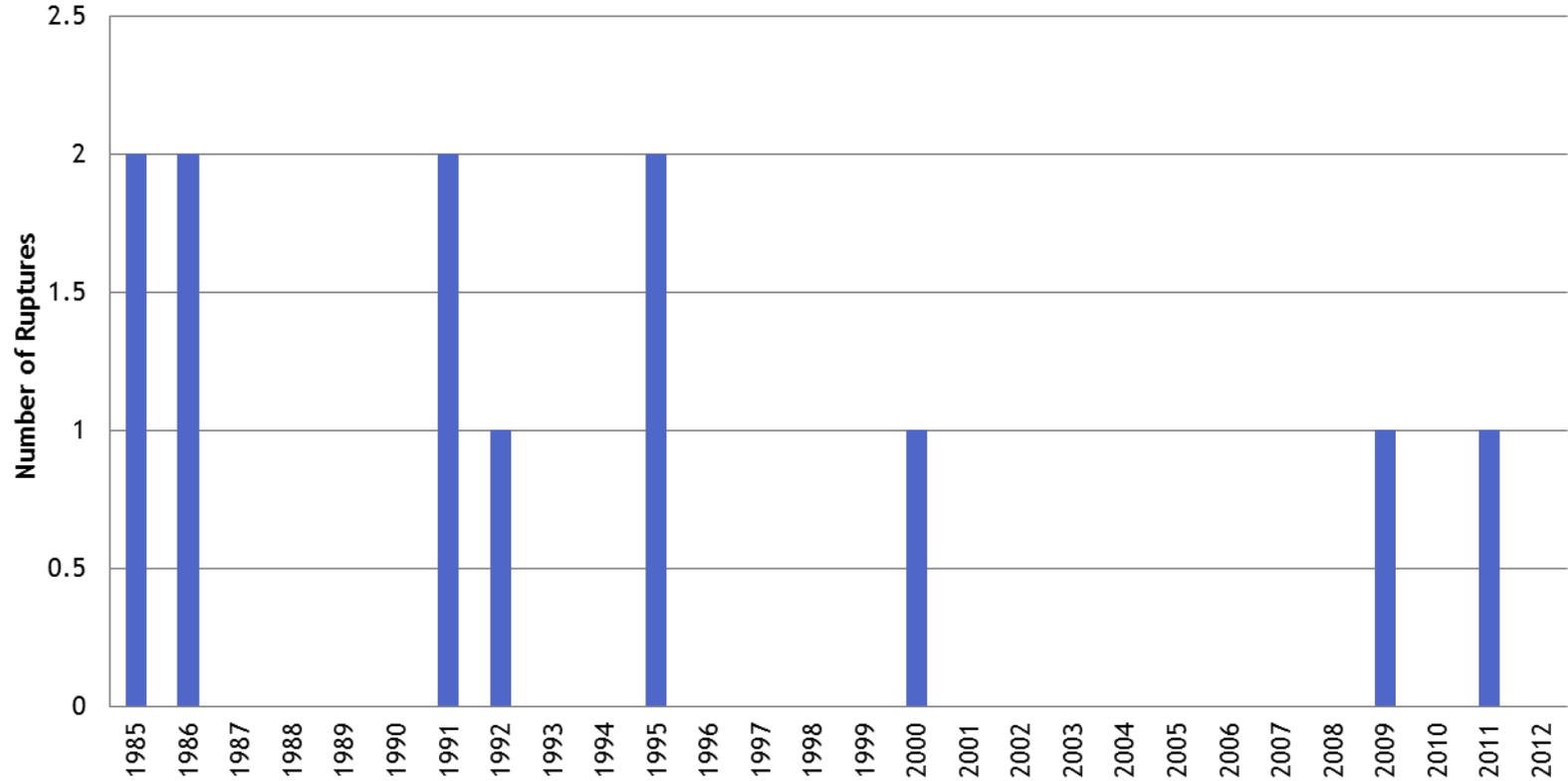
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From NEB Rupture Data:

NEB Regulated Pipeline Ruptures 1992-2012 Causes with Cracking Percentages



Number of SCC related ruptures in NEB Regulated Pipelines by Year 1985-2012

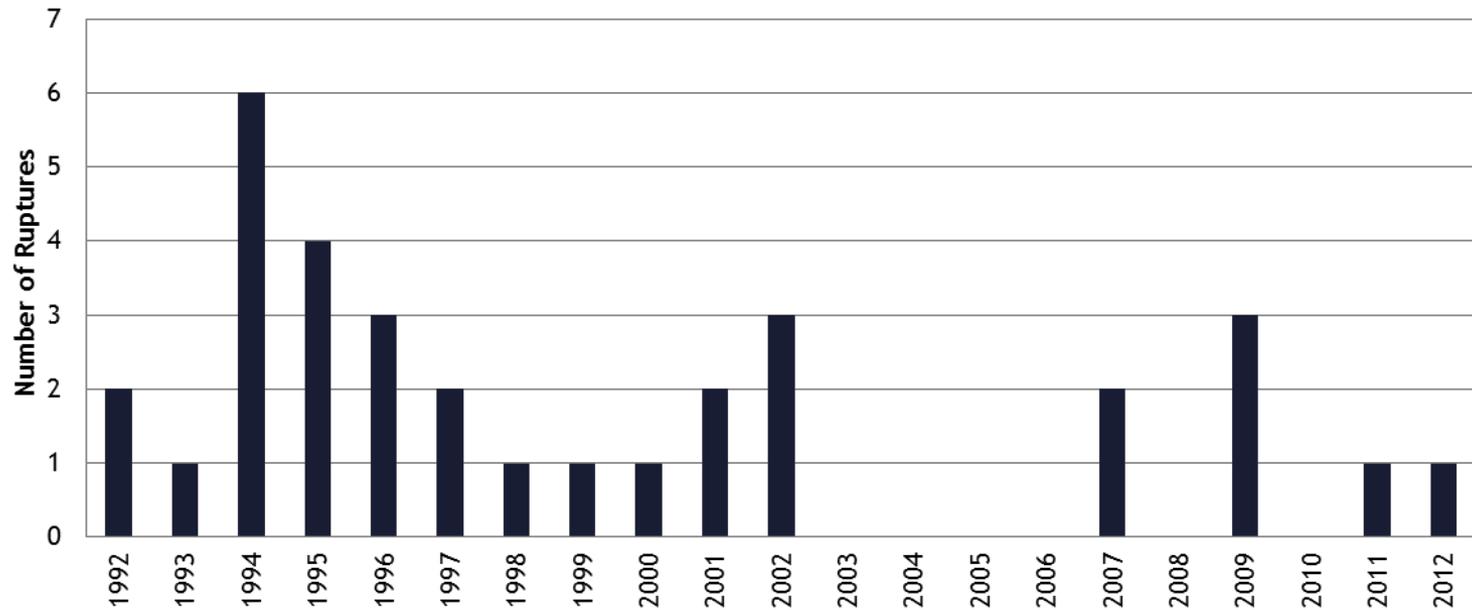


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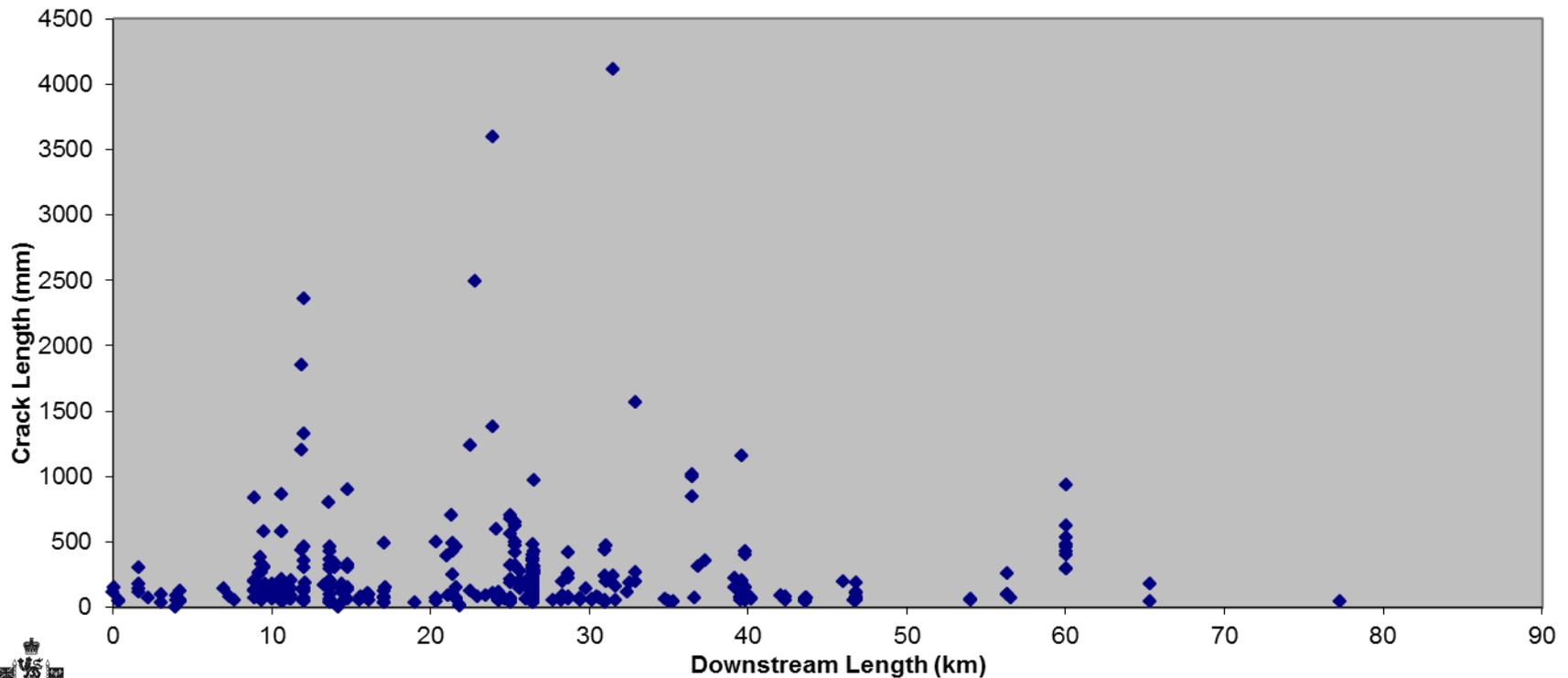
From NEB Rupture Data:

Number of Ruptures in NEB Regulated Pipelines by Year 1992-2012



Location of SCC damage

Distance Downstream from Nearest Compressor Station



NEB initiatives

- **1996: NEB's report on " Stress Corrosion Cracking on Canadian Oil and Gas Pipelines"**
 - Produced as a result of 12 ruptures and 10 leaks from 1977 to 1995 attributes to SCC in NEB regulated pipelines
 - The report provided 27 recommendations
 - Required companies to develop and implement SCC-management program.
 - A significant reduction in failures was seen after the report



Significant/reportable SCC

- **1997:NEB requires companies to report “significant” SCC that have been found in their system**
 - **“Significant” SCC definition:**

“SCC that is deeper than 10% of the pipe wall thickness and is as long as or longer than the critical crack length of a 50% through-wall crack at a stress level of 110% of the pipe’s specified minimum yield stress.”
 - **Companies report date and location of the SCC, pipeline attributes, SCC characters, mode of detection and mitigation method**
 - **NEB keeps a Database on the reports and periodically assess the data**



Performance measures

- **NEB currently requires companies to report on incidents, such as releases of substances and serious injuries.**
- **These lagging measures provide a historic view of company performance.**
- **in 2013, new leading performance measures were introduced**
- **NEB is of the view that a mix of leading, lagging, and qualitative measures can provide an overview of the effectiveness of a company in meeting program objectives.**
- **Currently the submission of performance measure data is only mandatory for certain companies selected by the Board.**



Integrity management performance measures

- The performance measures are not intended to be assessed for compliance purposes.
- NEB is evaluating the performance measure data to determine if companies are providing information that is consistent with the NEB's knowledge of pipeline performance
- For the “Integrity Management Performance Measures” companies require to provide information related to cracks.
- Cracks include both mechanically driven and environmentally assisted cracking (e.g. SCC, Stress Corrosion Fatigue) on the pipe body, seam or girth weld, as defined by Annex H of CSA Z662-11.



Metal loss, dent and crack measures

1. Pipeline Condition

The total number of features identified by in-line inspection for field investigation (according to integrity management program dig criteria) versus the total number of field verified features found to be defects and repaired by permanent or temporary methods, or mitigated by pressure reduction

- a. for the following hazards:
 - i. metal loss; and
 - ii. dents; and
- b. for cracks with a depth greater than 40% of the nominal pipeline wall thickness.



Objective

- **This measure provides data that is considered in assessing the effectiveness of a company's Integrity Management Program**
- **Field verified defect data versus number of features identified by ILI for field investigation will provide a leading measure of the effectiveness of the program**



The path forward

- **NEB requires the pipeline industry to use management systems to anticipate, prevent, manage and mitigate issues that can affect safety, security and environmental protection.**
- **On a go-forward basis, NEB's expectation is that the mandatory reporting of SCC and the use and reporting of performance measures will encourage and assist operating companies achieve this goal for cracking and other threats.**



Thank you

