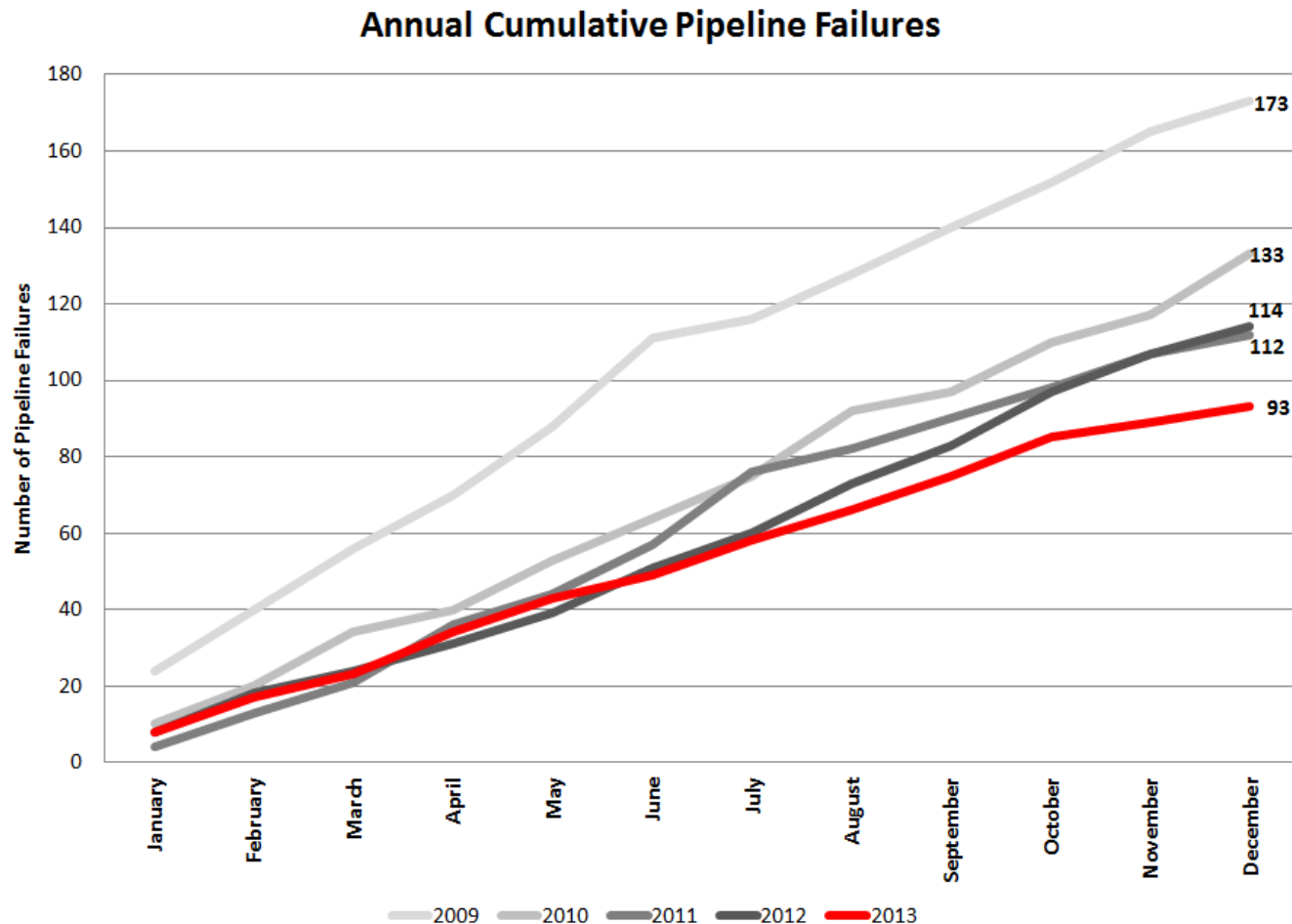




**PennWest**

The Cost of a Pipeline Failure  
Presented by Penn West

- Failure Statistics
- Cost of a Failure
- Failure Causes
- Integrity Management Plan
- Risk Assessment

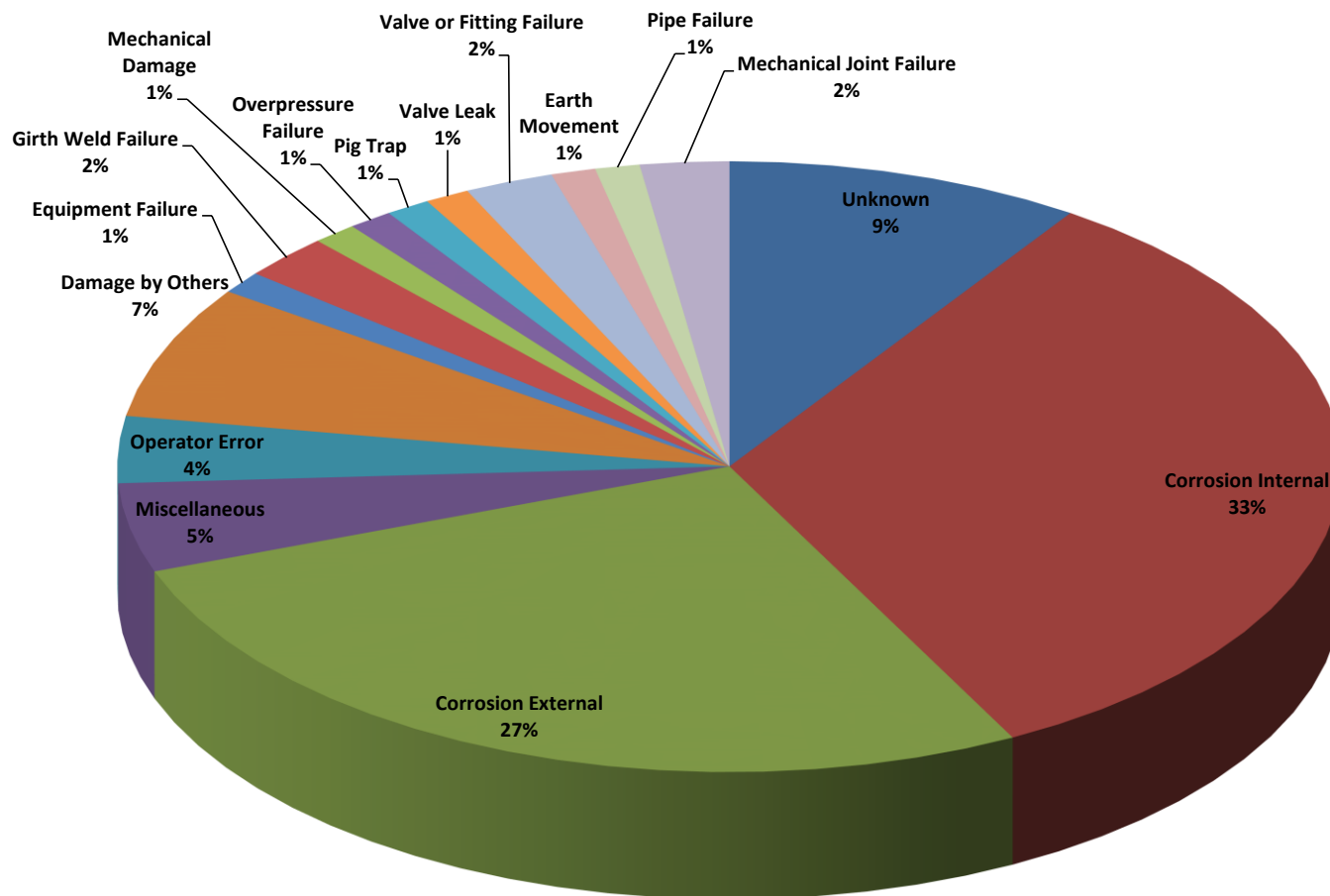


**We have had a reduction in pipeline failures of 46% from 2009**

- Total of 93 pipeline failures in 2013 – 112 pipeline failures in 2012
- Three large spills – one resulted in an AER news release
- Largest failure has a \$4.3 million cost incurred to date
- Second highest cost for clean-up was \$1.2 million and a third spill at \$600,000
- The average clean-up cost of failures this year with the three largest failures taken out \$85,000

- The cumulative environmental clean-up cost for 2013 was \$18.7 million
- 2012 clean-up costs were \$23.7 million
- 21% reduction in environmental clean-up costs corresponding to a 20% reduction in pipeline failures from 2012 to 2013

## 2013 Pipeline Failures by Cause



**\*The Unknown cause of failures are failures still being investigated.**

### **1. Pipeline Integrity Management Plan**

- Corporate commitment
- Purpose of the PL-IMP
- Why do we need a PL-IMP?
- Manual distribution
- Roles and responsibilities

### **2. Management Program and Processes**

- Implementation
- Work processes and record keeping
- Pipeline engineering assessments

### **3. Pipeline Operating and Maintenance**

- Overview of activities
- Highlights

### **4. Pipeline Acts and Regulations**

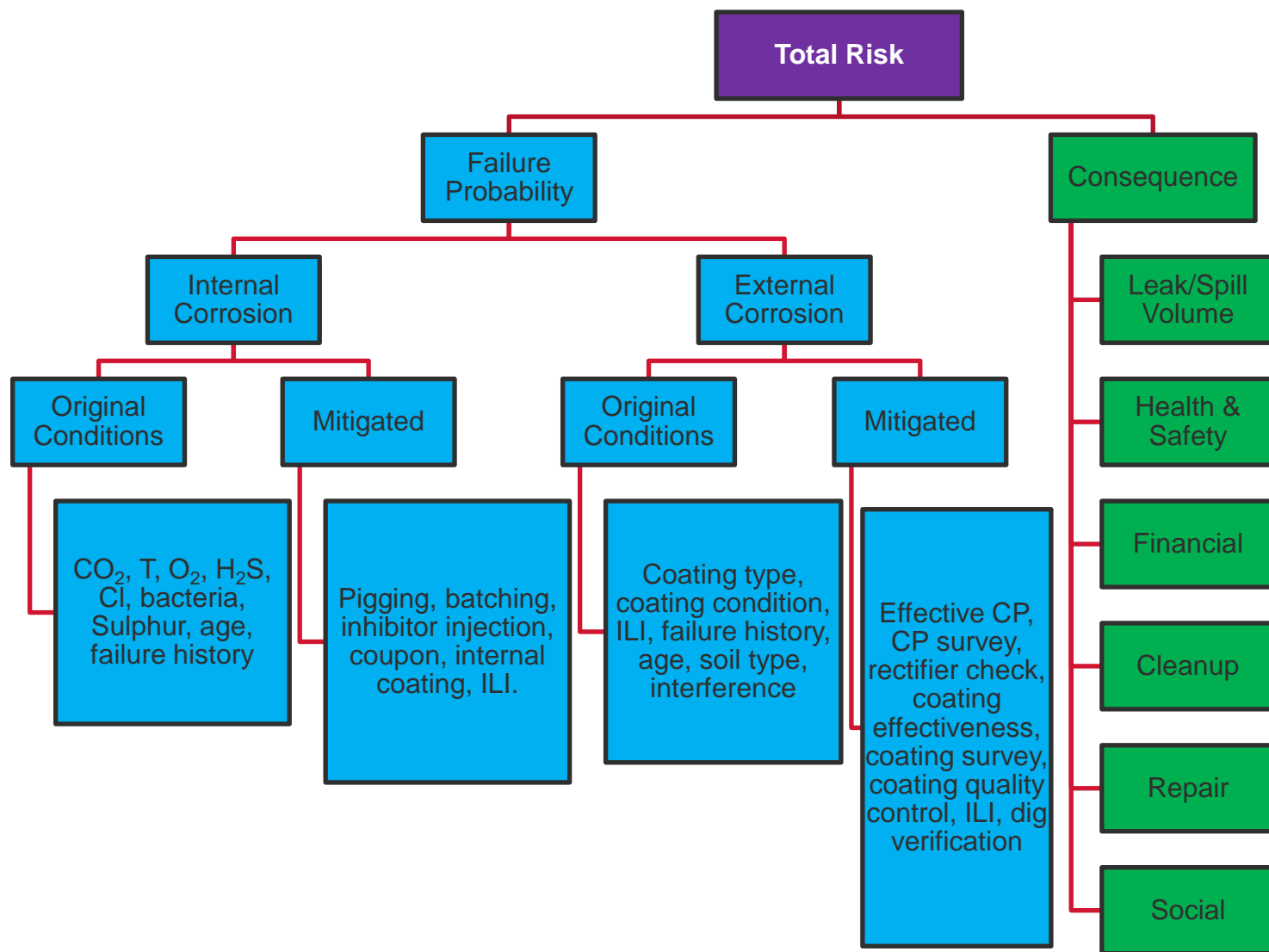
- Pipeline acts
- Regulations
- Directives and notification

- **Likelihood or Probability**
  - Probability or chance of something happening
  
- **Consequence**
  - The effect, result, or outcome of something occurring
  
- **Risk**
  - Likelihood x Consequence
  
- **Risk Assessment**
  - Process to assess risk (Likelihood and Consequence)
  
- **Risk Management**
  - Decisions on resource allocation



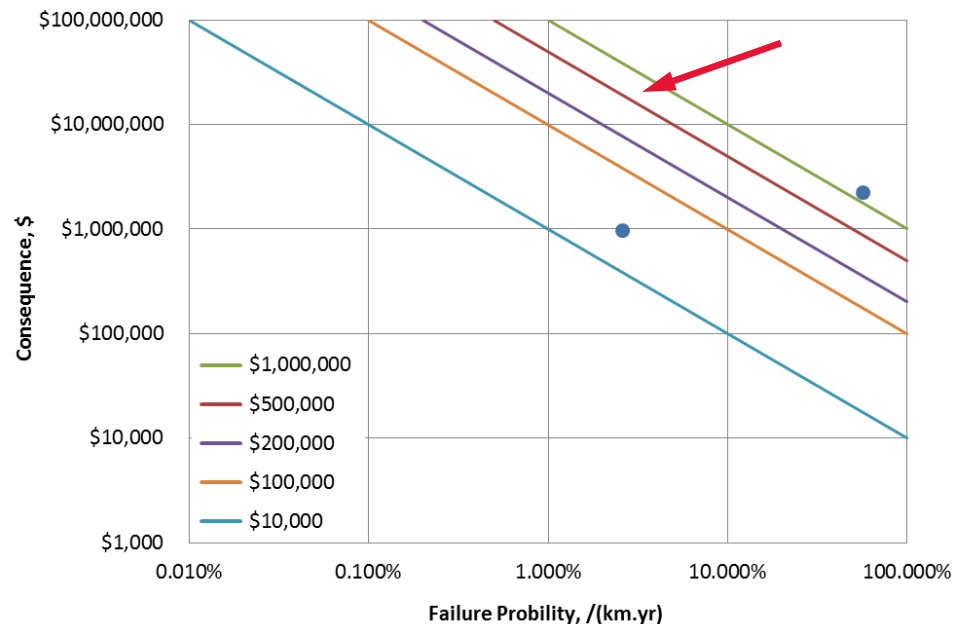
- Prioritize pipeline segments
- Evaluate benefits of mitigation
- Determine most effective mitigation, monitoring and inspection activities
- Allocate resources effectively
- Improve production reliability
- Continual assessment process





## ■ Risk Mitigation Strategy

- Data collection on all operated pipelines
- Calculation of risk
- Identify high risk pipelines
- Develop a mitigation plan
- Implement
- Monitor and inspect



- Pipeline failures have a huge impact to a company's bottom-line due to financial impact (environmental clean-up and lost production) and corporate reputation
- Implementation of an effective Pipeline Integrity Management Plan can significantly reduce pipeline failures
- High risk pipelines are identified through a risk assessment process and then further action is determined through the Pipeline Integrity Management Plan

