

# Prevention

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**R&D Forum**

**December 11/12, 2003**

**Jeff Didas - Colonial Pipeline**



# Strategic Objectives

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## 1. Develop programs to maintain integrity

- Reduce Corrosion Maintenance costs
- Improve ILI tools

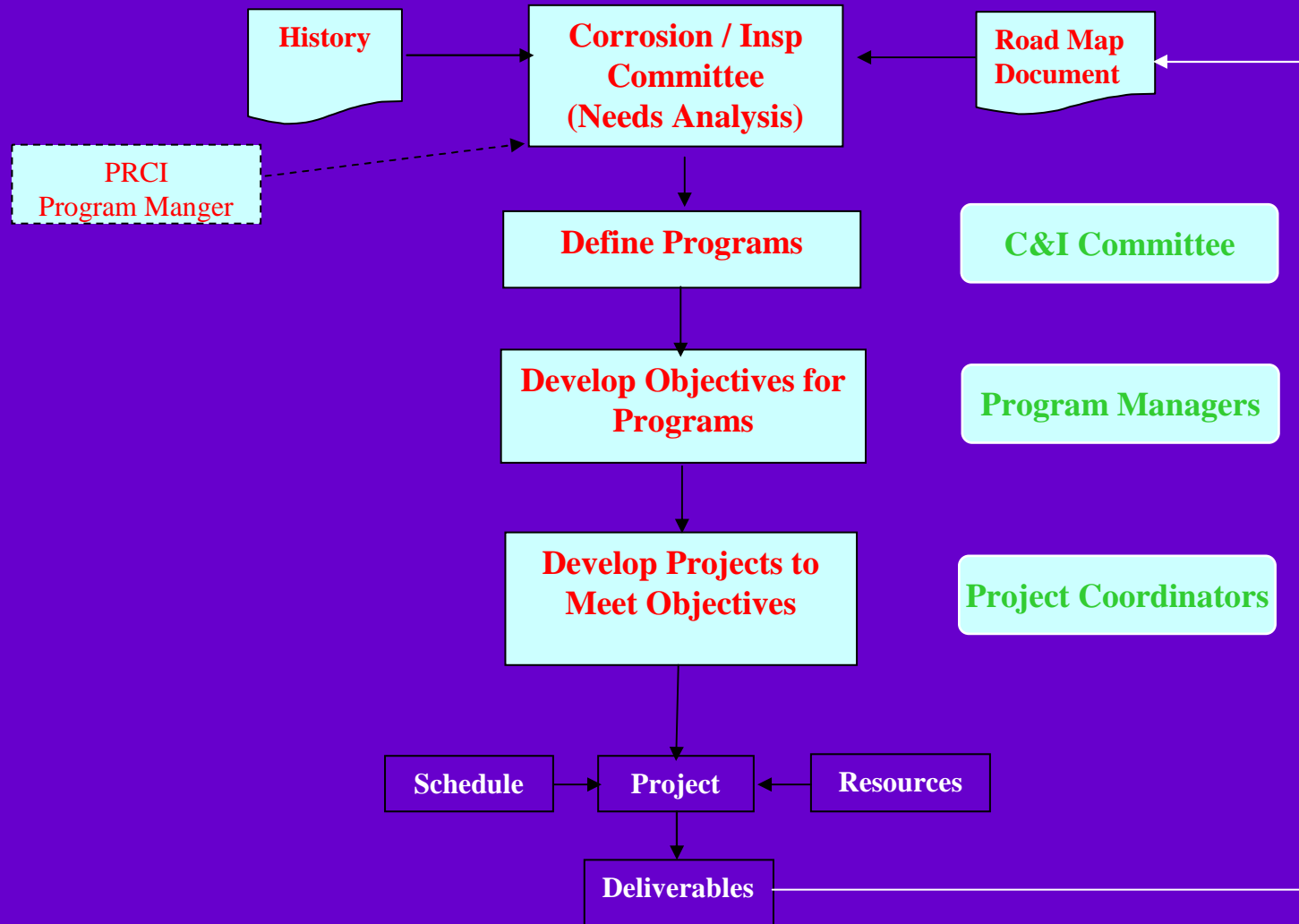
## 2. Develop programs to influence regulatory requirements associated with safety & integrity

- Support integrity and **Direct Assessment** initiatives

## 3. Develop programs to reduce capital costs of new pipelines

- Improve Corrosion Control Systems

# The Process



# The Road Map

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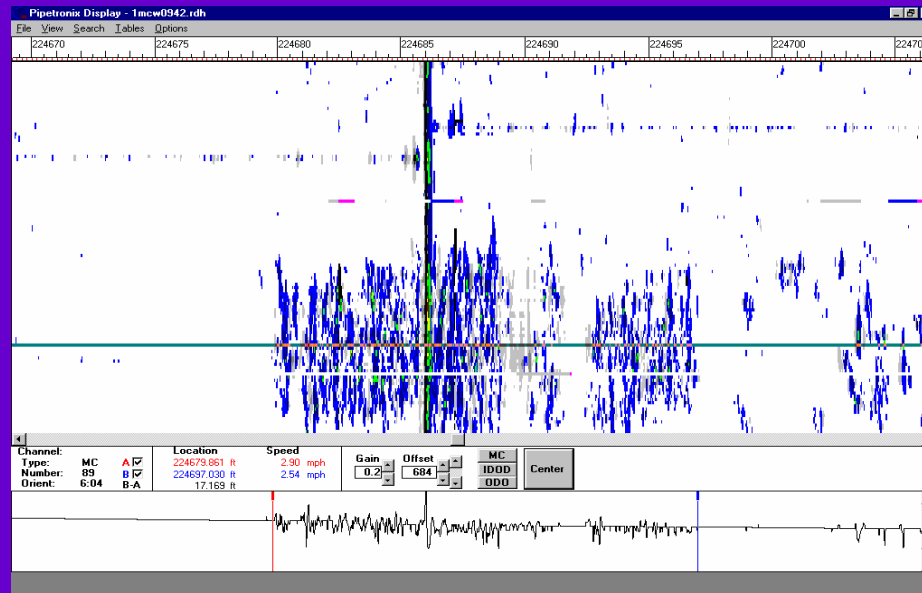
- Program Name
- Program Description
- Background
  - History of previous projects
  
- Objectives
- Projects
- Deliverables
- Schedule / Cost

<b>Program Name</b>	<b>2004 Goal</b>	<b>Co Fund</b>	<b>Pertain to Liquids</b>	<b>2005 Mort.</b>
<b>Mechanical Damage</b>	<b>586</b>	<b>865</b>	<b>70%</b>	<b>250</b>
<b>Non Piggable Pipelines</b>	<b>1220</b>	<b>500</b>	<b>98%</b>	<b>355</b>
<b>Shielded Pipe</b>	<b>356</b>	<b>450</b>	<b>100%</b>	<b>100</b>
<b>Internal Corrosion</b>	<b>545</b>	<b>980</b>	<b>10%</b>	<b>200</b>
<b>Assessment Intervals</b>	<b>175</b>	<b>0</b>	<b>100%</b>	<b>0</b>
<b>SCC</b>	<b>415</b>	<b>0</b>	<b>100%</b>	<b>65</b>
<b>CP Effectiveness</b>	<b>390</b>	<b>265</b>	<b>100%</b>	<b>150</b>
<b>Total</b>	<b>3696</b>	<b>3060</b>	<b>91%</b>	<b>1120</b>

# Optimize Integrity Assessment Intervals

## Description:

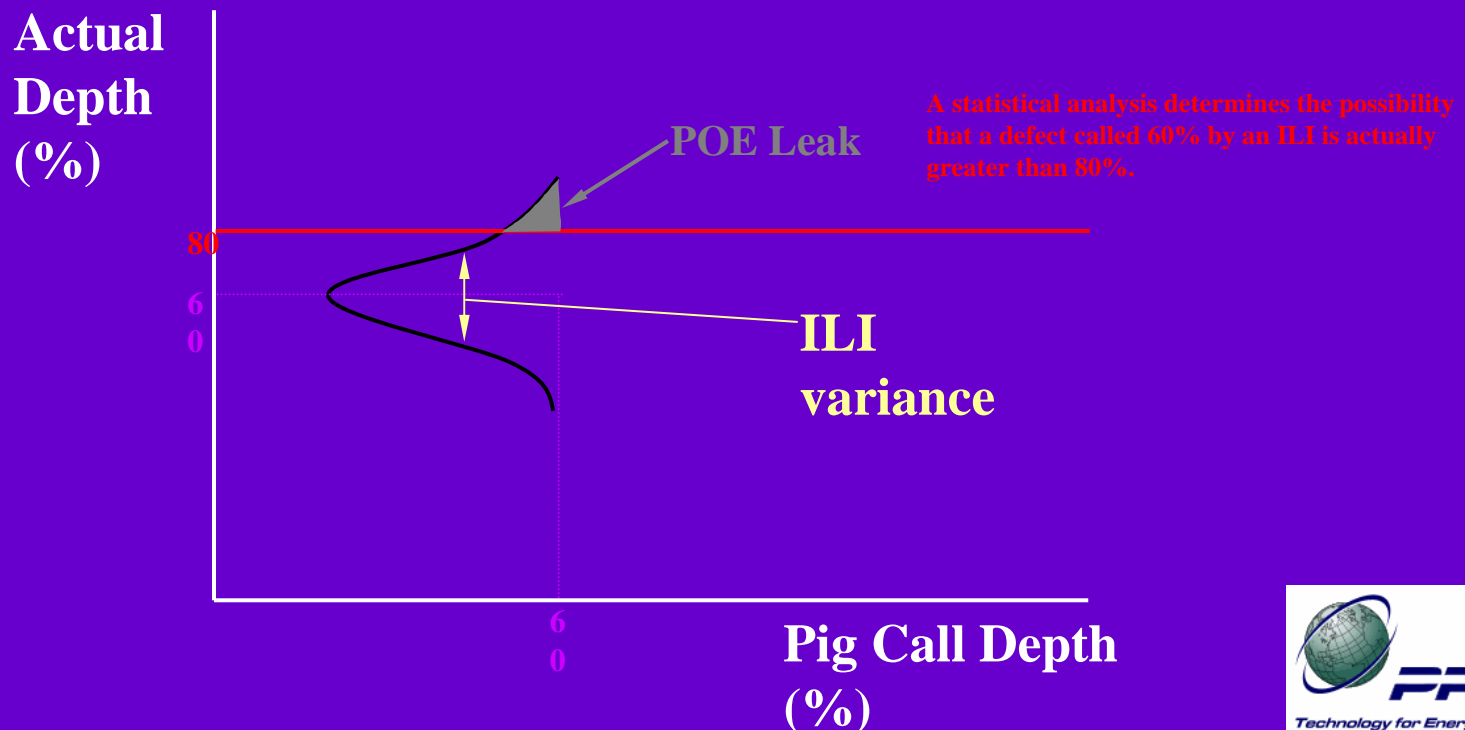
Establish a sound basis for estimating integrity evaluation intervals for the threats of internal and external wall loss corrosion. Integrity inspections come with variable measurement uncertainties and a probability of missing defects. Integrity re-evaluation intervals require an estimate of the largest unexcavated defect remaining and the corrosion kinetics.



# Optimize Integrity Assessment Intervals

## Description: (Continued)

A standard is needed for estimating corrosion rates from prior history, including inspection and bell hole records, coupons, etc that provides greater assurance that a real corrosion rate was estimated other than a simple straight line from the year of construction.



# Optimize Integrity Assessment Intervals

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## Schedule / Cost:

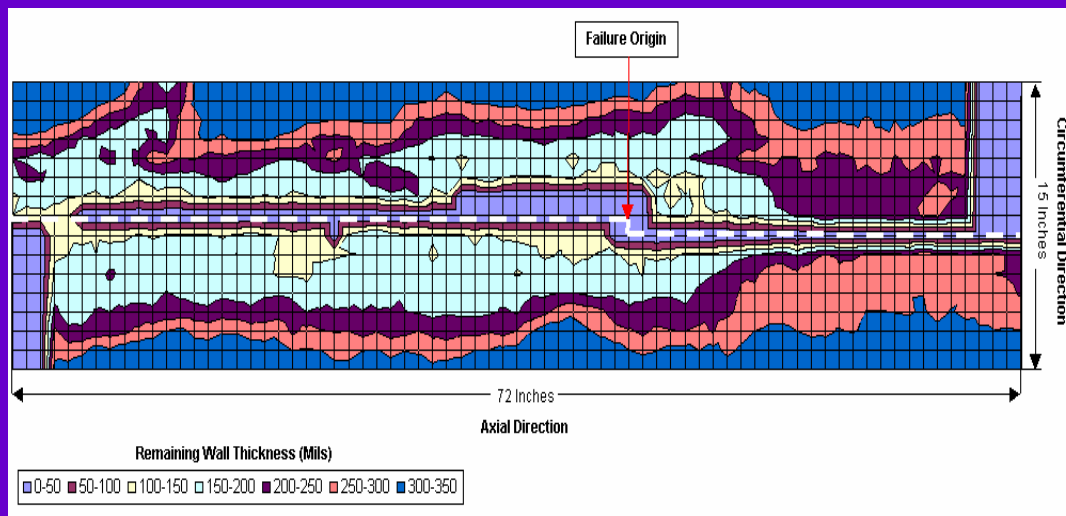
- 4 Year – \$825K
- 2004 Funding – \$175K



# Protect Shielded Pipe and Enhance Environmental Corrosivity Models

## Description:

- Detect and mitigate active corrosion at areas shielded from cathodic protection using above ground techniques
- Enhance use of voltage and current techniques to assess performance of cathodic protection systems (CP and coatings).



# Protect Shielded Pipe and Enhance Environmental Corrosivity Models

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## 2003 Projects:

- **Efficient Use of Cathodic Polarization Criteria (\$100K)**
- **Coupon for Disbonded Coating (\$200K) (BAA - Potential DOT Cofunding) (\$50K)**
- **High CP Potential Effects on Pipelines (\$80K)**
- **Mitigation of MIC Using CP including under Disbonded Coating (\$84K)**
- **CP Shielding Gap Analysis**
- **Evaluation & Comparison of Soil Resistivity Techniques**
- **MIC Investigation of Correlating Soil & SCC Initiation Phenomena**

# Protect Shielded Pipe and Enhance Environmental Corrosivity Models

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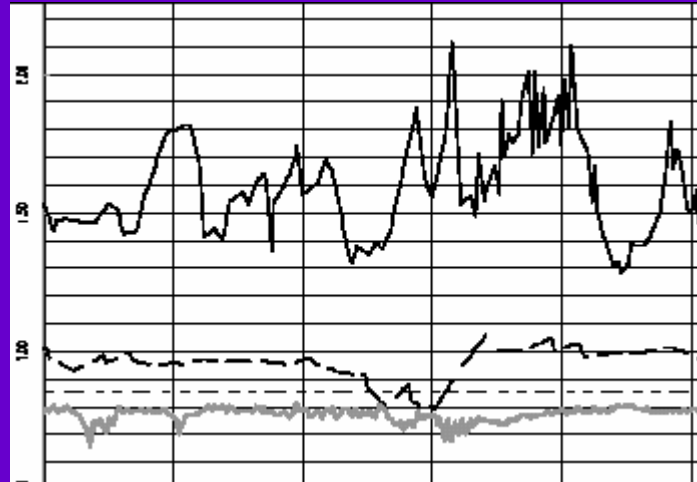
## Schedule / Cost:

- 5 years – \$4,500K
- 2004 Funding – \$365K

# Improve CP System Effectiveness

## Description:

Improve cathodic protection (CP) by defining the impact of high resistivity soils and increased coating degradation on performance monitoring.



# Improve CP System Effectiveness

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## 2003 Projects:

- **Permanent Reference Electrodes Test Program**
- **Determine under what conditions AC corrosion is a problem in typical power line corridors.**
- **Characterizing Coating Performance with Varying Surface Preparations**
- **Effective Coating Removal During Investigative Excavations**

# Improve CP System Effectiveness

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## Schedule / Cost:

- 5 Year – \$1,200K
- 2004 Funding – \$390K

# Gaps / Additional Research Needs

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- External Corrosion Rates to Determine Reassessment Intervals
- Internal Corrosion Rates to Determine Reassessment Intervals
- Others?

# Summary

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- Various Programs Which Address Operators and Regulators Concerns
- Consensus Process
- Broad Spectrum of Input by Researchers, Gas Pipelines, Liquids Pipelines and Regulators
- Road Map to Ensure Focus