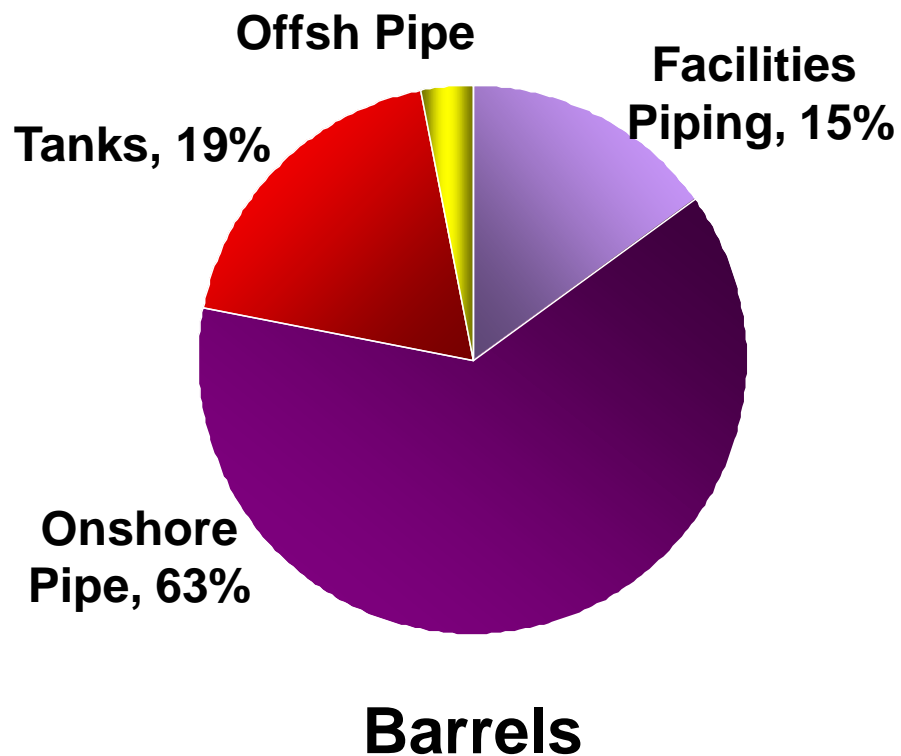
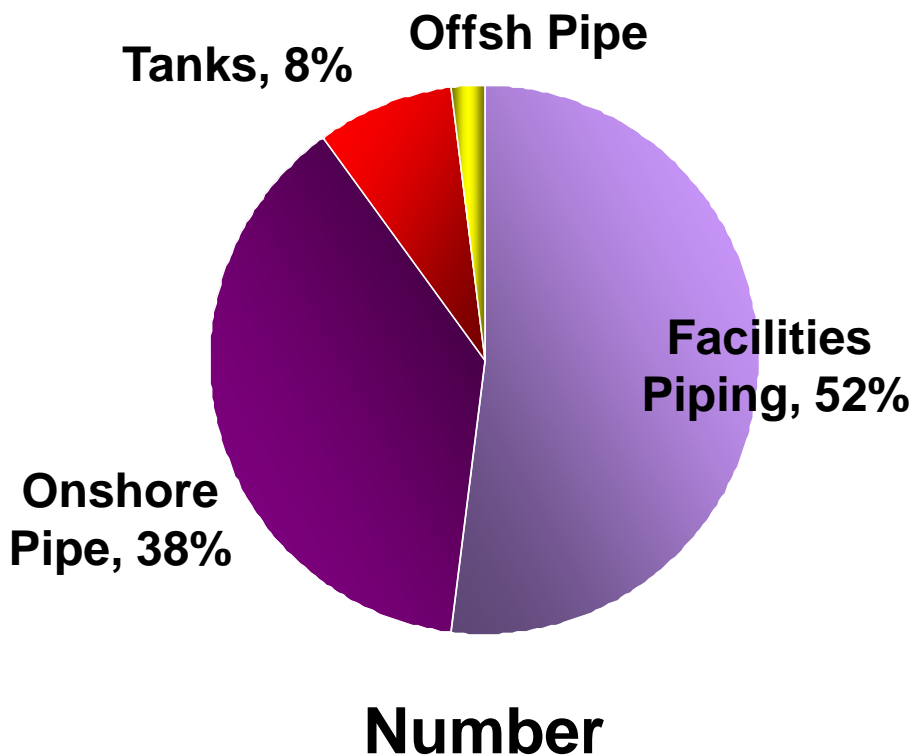


# Facility Releases

API Pipeline Conference

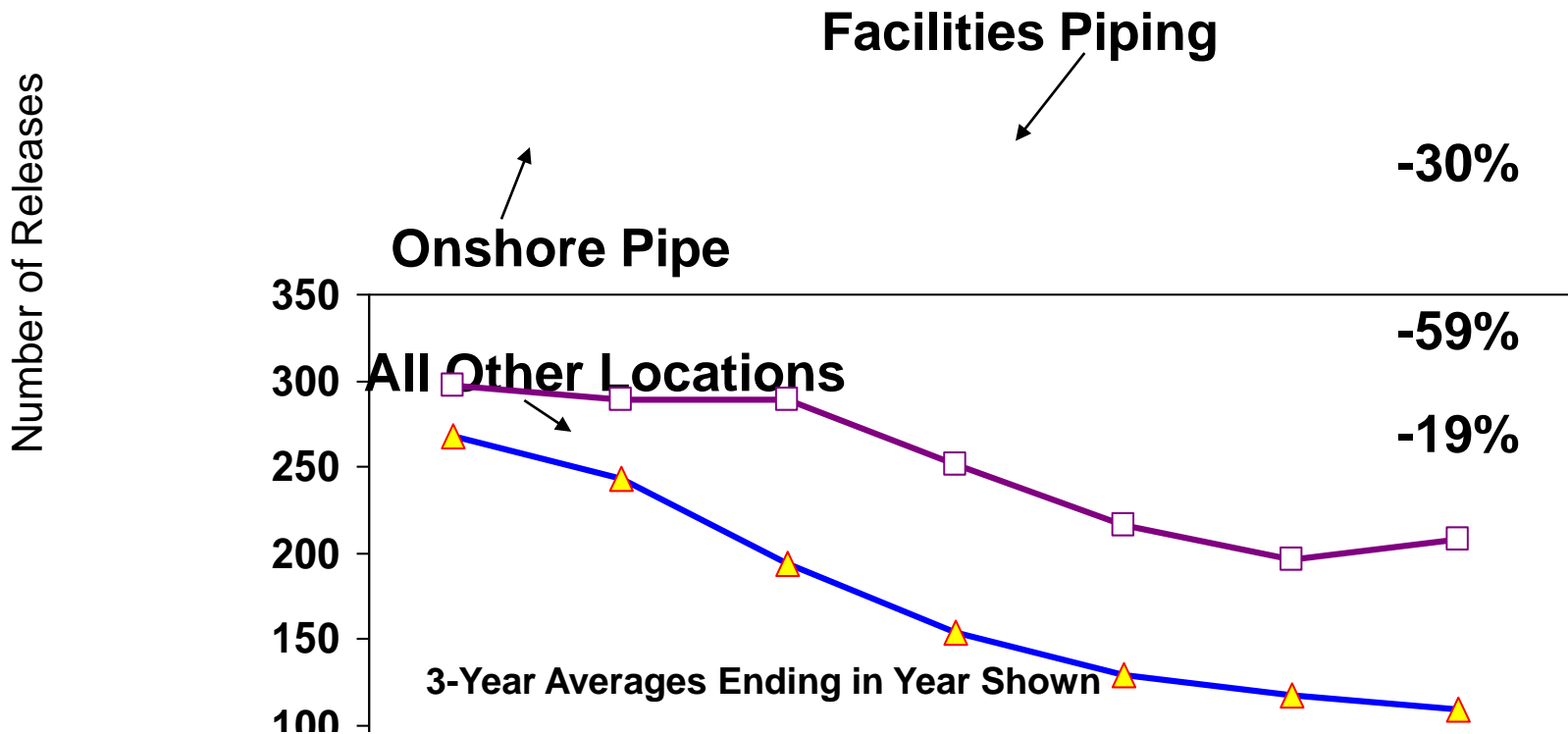
April 22, 2009

# Facilities Piping Spills Smaller: 52% of Number, 15% of Bbls



Cavern releases not depicted (<0.5%)

# Release Trends (3yr avg.)

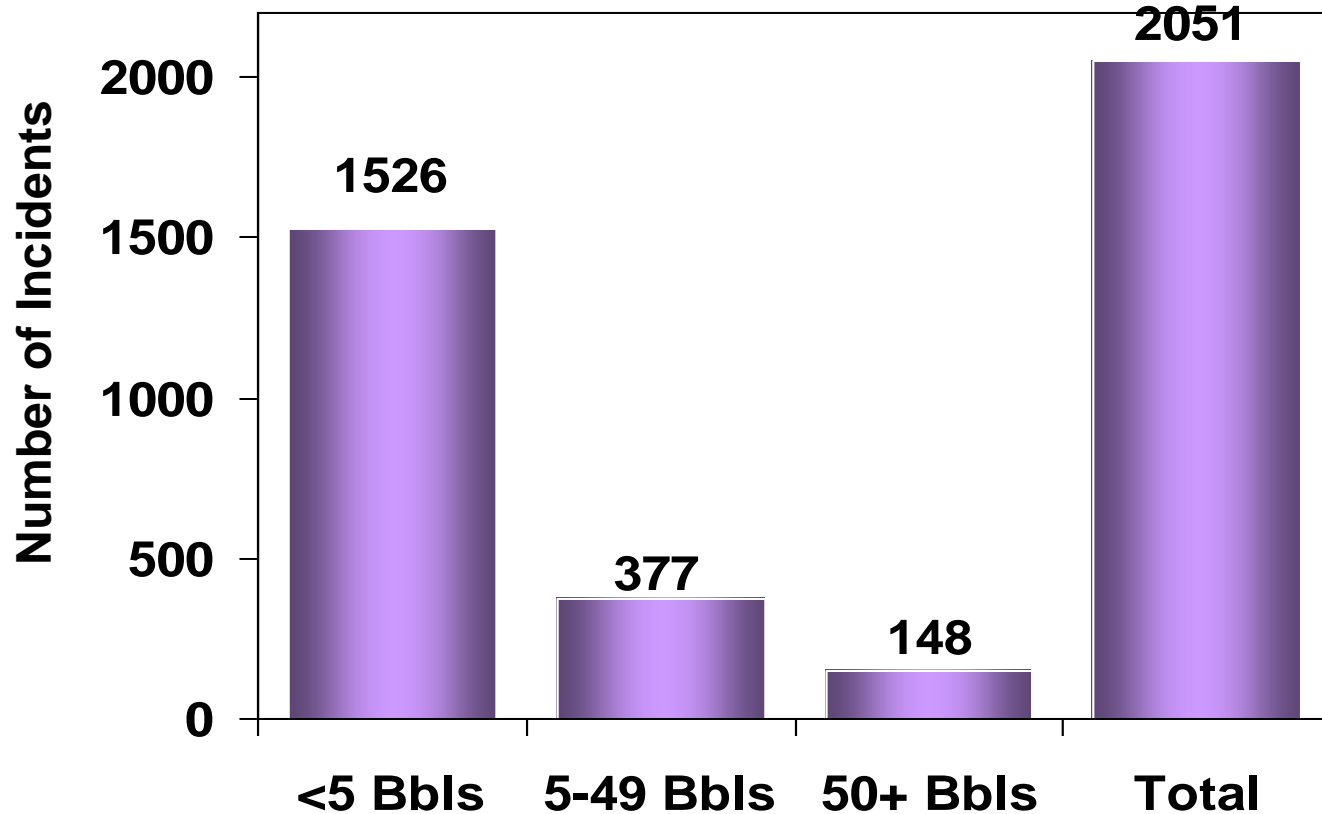


All other locations: tanks, caverns, offshore pipe  
 Source: Pipeline Performance Tracking System, 1999-2007.

## What do we mean by “Facilities Piping”?

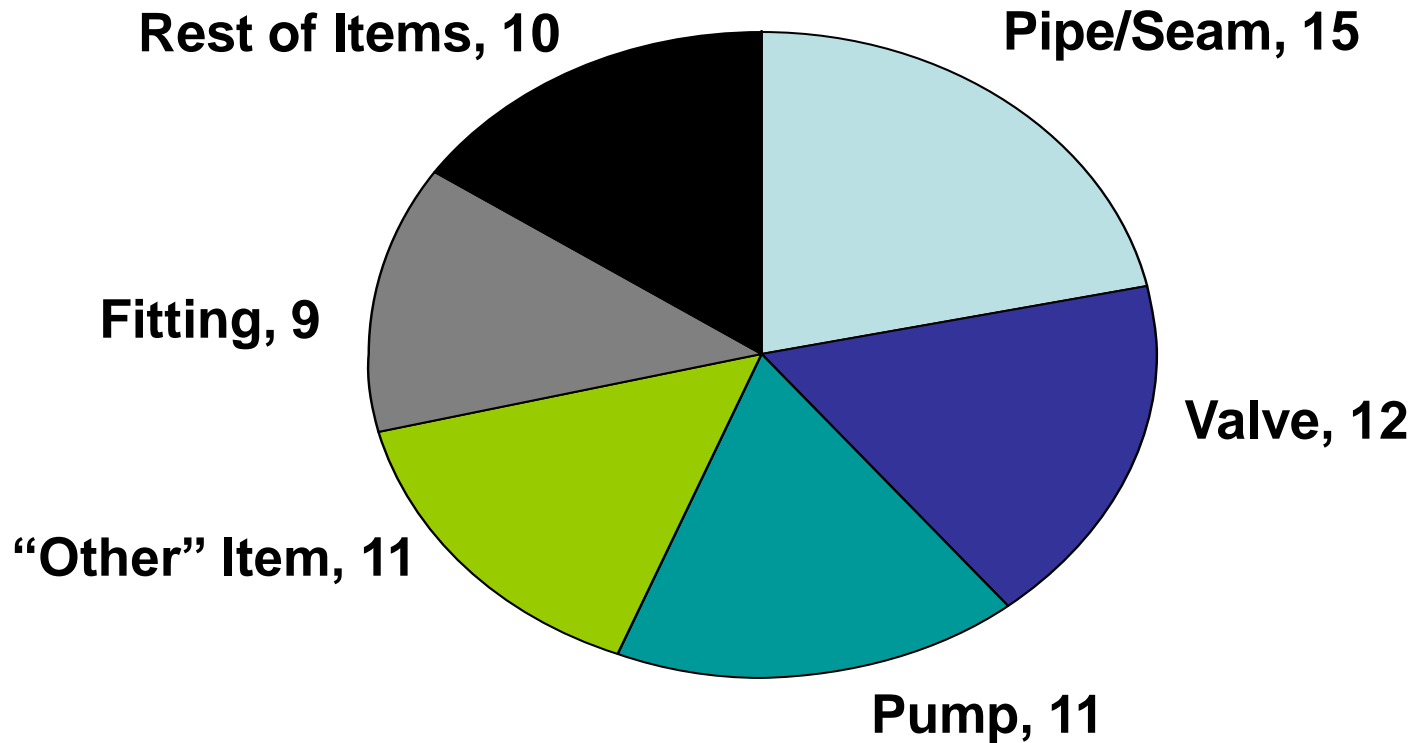
- Pump/meter station; terminal/tank farm piping and equipment, including sumps
- Usually a fenced facility, like “XYZ Station”
- Not
  - Tanks – i.e., the vessel
  - Valve sites along the right-of-way

# Facilities Piping Spills Smaller: 74% are less than 5 bbls

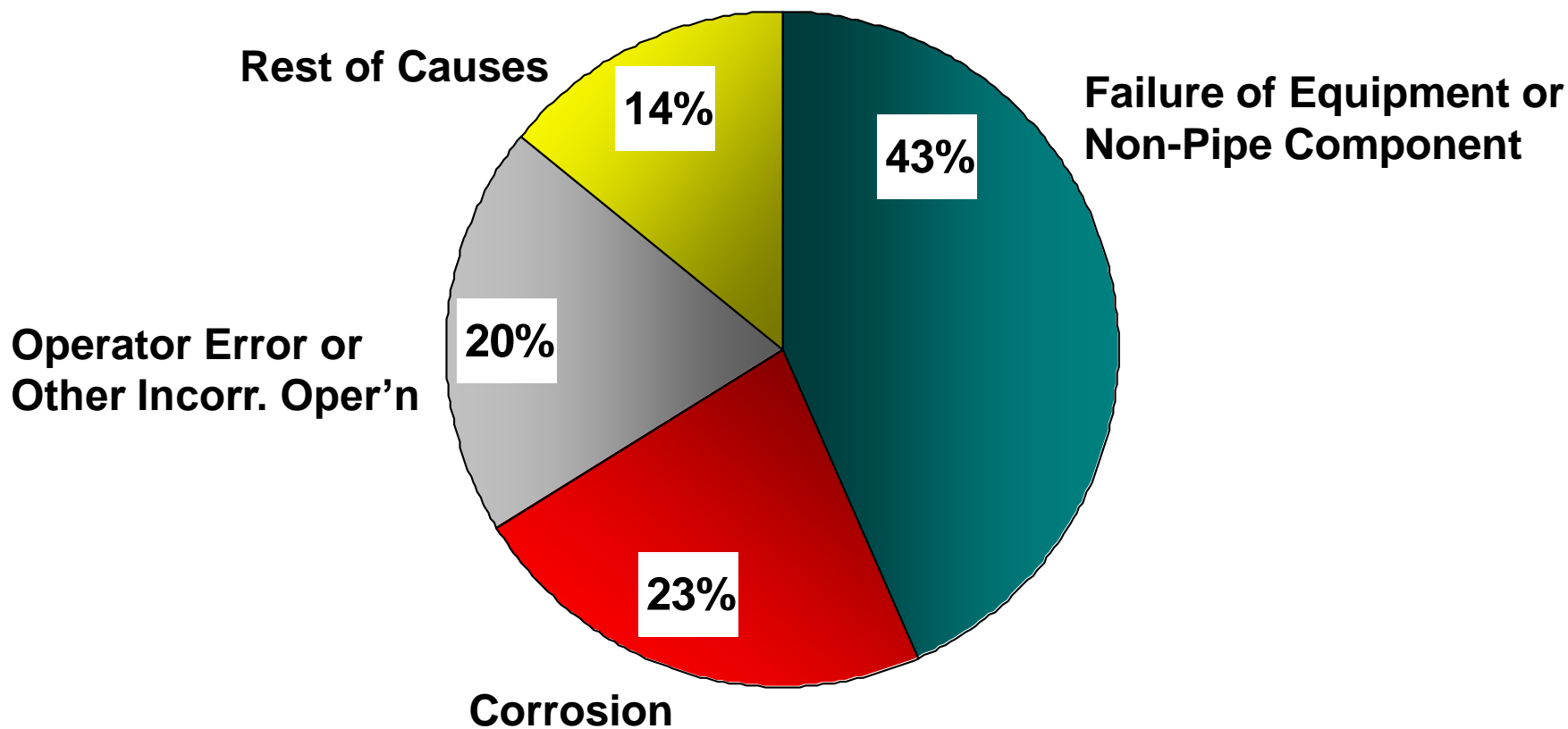


# What Component Is Involved? Pumps Over-Represented

Annual Avg Number, '99-06



# Facility Releases – All Causes



# Process

1. Examine PPTS data & select target areas
  - 4 from Pipe category
  - 2 from Non-Pipe Equipment related
2. Get specific data on these releases
  - Data in PPTS limited somewhat
  - Craft a survey for those 6 areas
3. Industry responds to survey through **Survey Monkey**

## Process (cont'd.)

### 4. Committee reviews survey results

- Identifies trends, patterns, commonality of releases
- Have's and Have Not's
  - Why?
- • Look for possible solutions to groups of historical releases
- Filter best practices back through OTC
- Submit to Industry
- ✓ Develop performance measures through PPTS data
- ✓ PPTS Revisions:
  - Better choices for easier consistent reporting
  - Drill downs for contributing factors

### 5. Move to Round II – most likely pumps

- Seal/packing issues

# Survey for Facility Releases

- 11 Operators responded to the survey
  - 5 year period 2003-2007
  - Dead Legs, Drain Lines, Relief Lines, Tubing and Small Piping, Valve Vaults, Inspections
- Good representative mix of data
  - Large operators
  - Cross spectrum of operations
- Respondents represented:
  - 57% of PPTS mileage
  - 57% of P/S's
  - 41% of Meter facilities
  - 60% of HCA mileage

# Survey Attributes

- We examined:
  - Material
  - Function
  - Cause
  - Connection type
  - Operational characteristics
    - Flow, pressure, commodity

# Survey Overview

## Number of Incidents by Survey Section

Section	Number of Incidents	Share of All Incidents	Number of Incidents Also in PPTS	Share of Incidents Also in PPTS	Number of Operators With an Incident
Dead Leg Piping	29	16.1%	16	17.2%	5
Drain Lines	40	22.2%	21	22.6%	6
Relief Lines	17	9.4%	7	7.5%	4
Tubing & Small Piping	93	51.7%	49	52.7%	8
Valve Vault	1	0.6%		0%	1
Grand Total	180	100%	93	100%	10

# Preliminary Observations

- Tubing Releases are a “big” issue
  - Connections vs tubing/piping itself
    - 66% in fittings vs 33% in tubing/piping itself
- Time trends do not see ratable improvement in facility releases over last 5 yrs
  - Spike in incident #'s in 2005 (tubing & small piping)
  - Have not returned to 2003 level
- Human Error is evident as contributing cause in several categories

## Preliminary Observations (cont'd.)

- Tubing/Small Piping
  - Fittings are biggest point of failure
  - Tubing/small piping failures evenly split
    - Carbon Steel and SS
  - No product differentiation
  - Improper installation (cause) a serious concern
  - Vibration (cause) is a significant cause of failures
    - What is the level threshold?
  - Human Error evident as cause

## Preliminary Observations (cont'd.)

- Drain Lines
  - A/G crude systems subject to freezing (9 of 21)
    - Water in crude or laying in lines
  - Internal Corrosion most prevalent in B/G crude drain lines (6 of 16)
    - Low points
  - For threaded connections, freezing most common cause of releases
    - 44% 7 of 16

## Preliminary Observations (cont'd.)

- Relief Lines
  - 2/3 of releases involved fitting
  - Largest causes:
    - Corrosion (6 of 17; 5 were internal corrosion)
    - Relief valve failures (5 of 17)

# Preliminary Observations (cont'd.)

- Dead Legs

- Internal Corrosion the “enemy,” so directed survey to Internal Corrosion incidents
- 5 of 11 operators reported a dead leg incident
- Crude operator issue (26 of 27 where commodity reported)
- Flushing of dead legs a worthy practice
  - In 22 out of 24 releases on dead legs, lines were **not** flushed at least annually
  - Even on 12 of 13 incidents on known dead legs
- Few operators looking for MIC “post release”
  - Only 1 operator in 1 of its 7 releases

# Preliminary Observations (cont'd.)

## • Inspections

- 17 Question areas, plus drilldowns
- Work in progress

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### Examples of Areas and Responses in Inspection Survey

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Question	Yes	No	% "Yes"
Checklist for walkarounds	6	5	54.5%
Is your program based on a risk evaluation?	6	5	54.5%
Periodic evaluation for aboveground pipe?	7	4	63.6%
Periodic evaluation for belowground pipe?	5	6	45.5%
Periodic sump testing?	1	10	9.1%
Periodic scraper trap integrity testing?	2	9	18.2%
Valve inspections including non-DOT valves?	4	7	36.4%
ETC.			

## Survey “Take Aways”

- Data Collection is critical at time of incident
  - Survey completion technical **NOT** clerical
- Survey setup initially limited space for incidents
- “Other” is not a helpful answer
  - Insufficient data to answer
    - Take care with questions
  - Mixing of cause and result in same question
- Criteria should match PPTS thresholds
- Survey assisted in refining PPTS data collection
  - Measurement of progress
  - Improved definition of item, cause

## Next Steps

- Complete Data review
- Draft PPTS Advisory
  - Tubing
  - Drain Lines
  - Dead Legs
  - Relief Lines
- PRCI Initiative – Pumps & Compressor Stations
- Move on to Round II – pumps?

## OTC Subcommittee

- Facility Integrity Team
  - Dave Pearson - Colonial
  - Debbie Price - Shell
  - Kevin Badgett - XOM
  - David Finley - BP
  - Peter Lidiak – API
  - Steve Broker – SXL
  - Steve Irving – Enbridge
  - Scott Ironside – Enbridge
- Cheryl Trench – Allegro Energy Consulting
  - Data analysis and slide preparation
  - DMT