

The Oil Pipeline Industry Had an Idea . . .

Learning from PPTS 1999-2007

Understanding Hazards

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A Presentation to

Pipeline Safety – What More Needs To Be Done?

A conference sponsored by The Pipeline Safety Trust

Consequences

Improving Performance

Spills

Deaths

Injuries

Error-Free Operations

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What is the Pipeline Performance Tracking System?

- ✱ **“PPTS”**: voluntary; open to all liquids pipeline operators
- ✱ **No membership req’d, no fee imposed**
- ✱ **Industry-run and maintained**
- ✱ **Collecting info since 1999**
- ✱ **Records spills of 5 gallons or more on land, all spills to water (compare old OPS @ 50 barrels)**
- ✱ **In 2007, PPTS participants operated about 85% of OPS miles and total barrel-miles**

1. Measure 2. Learn 3. Manage 4. Improve

Data Mining Highlights

- ✱ **Team Composed of Diverse Subject Matter Experts**
- ✱ **Operator Advisories (www.api.org/ppts)**
 - ➔ Causes/locations with a large share
 - ➔ Consequences
 - ➔ New perspective via PPTS
 - ➔ Guidelines for reporting
 - ➔ FAQs for consistency
- ✱ **Reports and Fact Sheets**
- ✱ **Also, Performance Excellence Team**



The data doesn't go in and not come out!

PPTS Participants Use PPTS

- ✱ **To measure operator/Industry performance**
- ✱ **To allocate \$**
 - ✓ Maintenance
 - ✓ IMP
 - ✓ R&D
- ✱ **To direct regulatory/advocacy effort**
- ✱ **To find new approaches to keeping people and communities safe**

Key Elements in PPTS Success

☀ **Commitment**

- Pipeline Leadership
- API/AOPL

☀ **Care and Feeding (API's Commitment)**

- QC: Transparency, credibility
- Program Software/Mechanics
- Data Mining Team

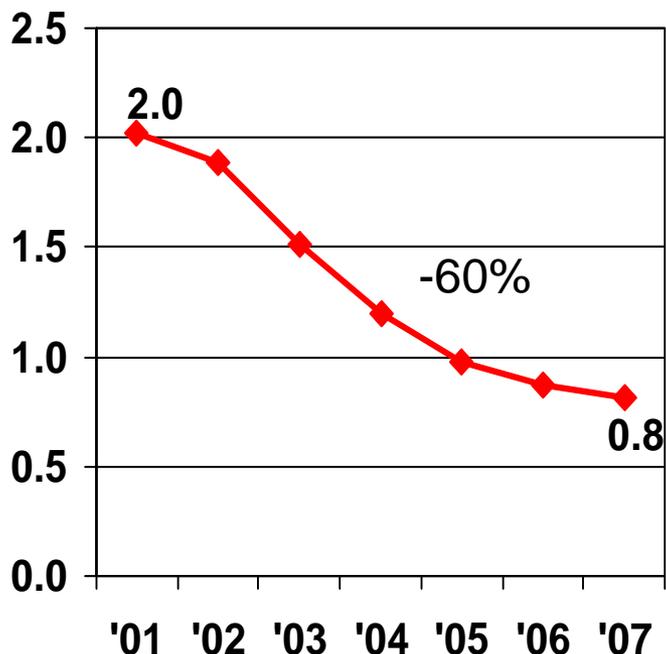
☀ **Learning**

- Data Mining Team
- Lectures
- Website

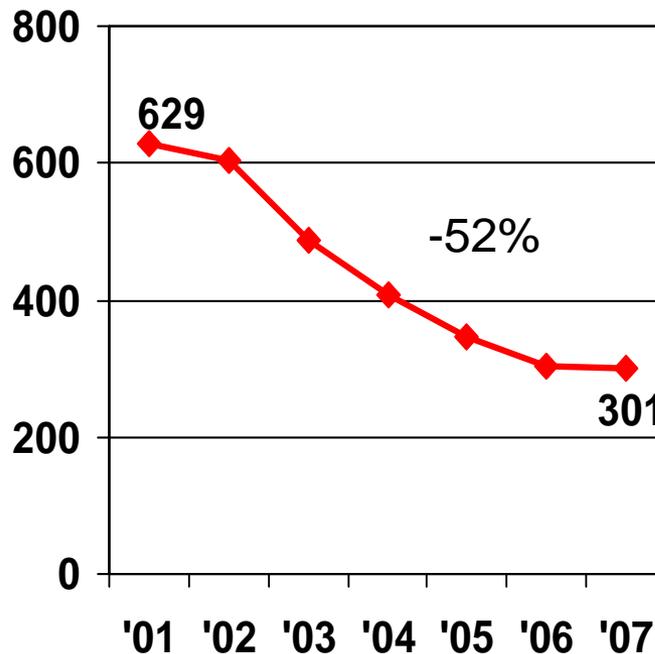
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Dramatic Improvement: Liquids Pipeline Industry Onshore Pipe Spill Record

Number of Spills per 1,000 Miles



Barrels Released per 1,000 Miles

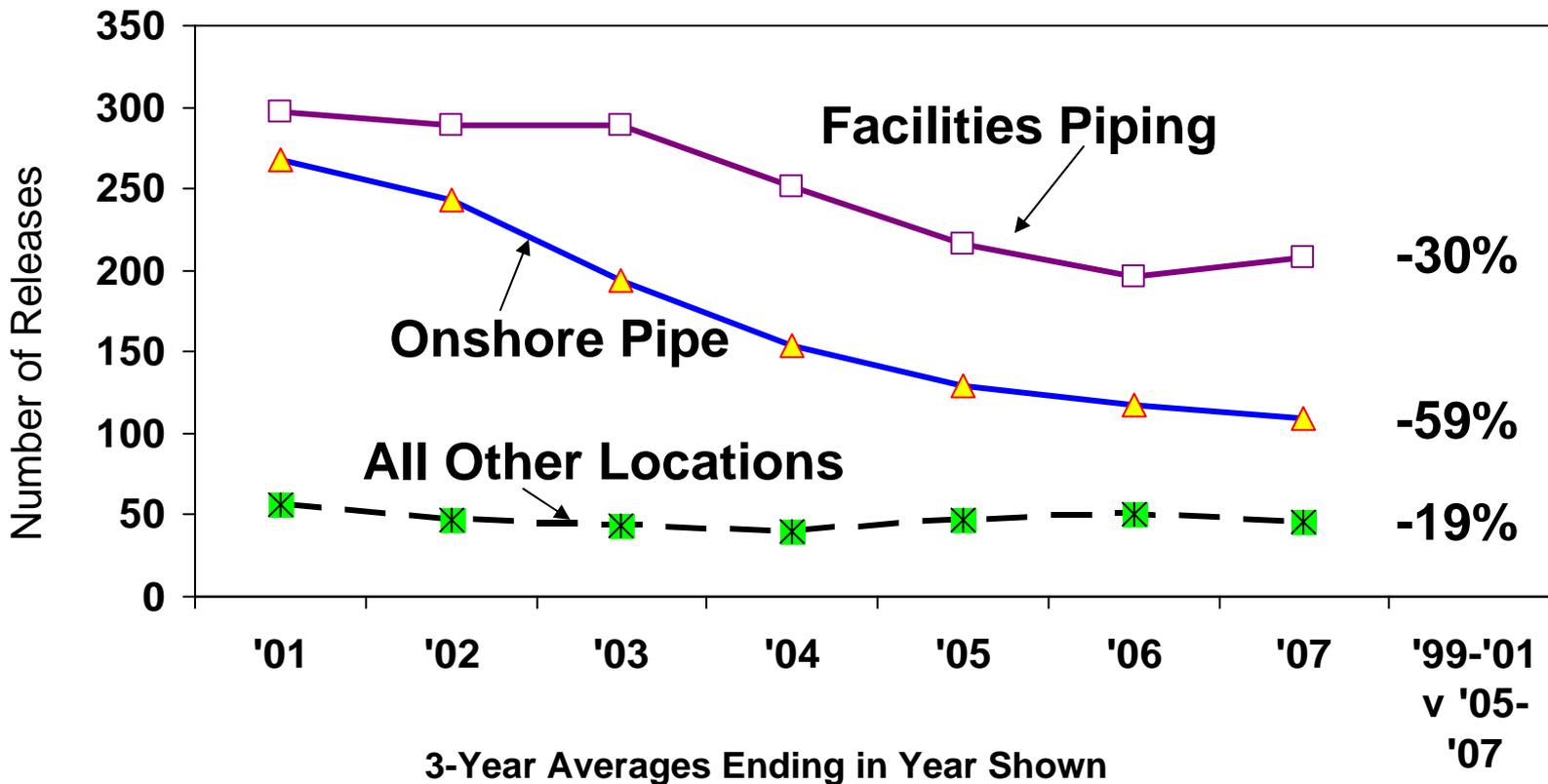


3-Year Averages Ending in Year Shown

Source: Pipeline Performance Tracking System, a voluntary spill reporting system involving 85% of the U.S. liquids pipeline mileage. Percentage decline from 1999-2001 average to 2005-2007 average.

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Releases along the right-of-way have fallen by almost 60%



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

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System location and risk

Facilities piping: more of them, but small
Onshore pipe: fewer of them, but larger

Incidents by System Locations, 1999-2007

	Number	Barrels
Total (annual average, 1999-2007)	476	90,983
Share of Total		
Facilities piping	53%	14%
Onshore pipeline	37%	65%
Aboveground Storage Tank	8%	18%
Offshore pipeline	2%	2%
Cavern	0%	0%

Includes releases due to hurricanes Ivan, Katrina and Rita.
Source: Pipeline Performance Tracking System

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Where Are People Getting Hurt or Killed? Deaths and Injuries by System Part

	System Part	Incidents (#, '99-'07)	Empl.	Contr. (# People)	Other	Total
Fatalities	Facilities Piping	1	1	0	0	1
	Onshore Pipeline	8	2	2	12	16
	Grand Total	9	3	2	12	17
Injuries	Aboveground Storage Tank	1	1	0	0	1
	Cavern/belowground	1	1	0	0	1
	Facilities Piping	3	2	6	0	8
	Onshore Pipeline	16	2	1	30	33
	Grand Total	21	6	7	30	43

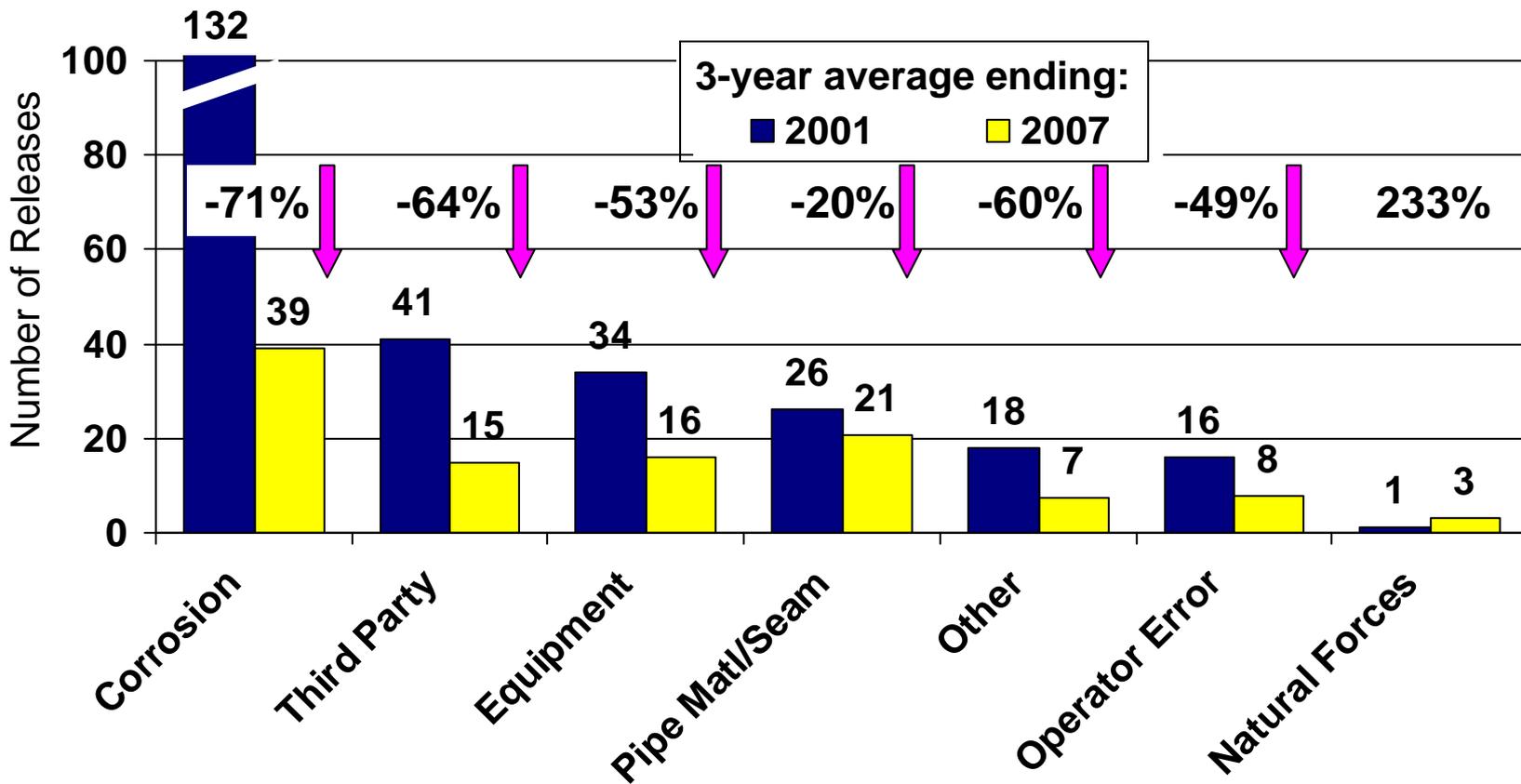
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Assessing Consequences: Deaths and Injuries by Cause

	Cause	Incidents (#, '99-'07)	Empl.	Contr. (# People)	Other	Total
Fatalities	Third Party Damage	4	0	0	10	10
	Operator Error	2	0	2	0	2
	Other	3	3	0	2	5
	Total	9	3	2	12	17
Injuries	Third Party Damage	8	0	0	17	17
	Operator Error (incl. excavation)	5	4	6	0	10
	Pipe mat'l/seam	2	1	0	2	3
	Corrosion	2	0	0	3	3
	Equipment Malfunction	1	0	0	1	1
	"Other failure" in a Tank	1	1	0	0	1
	Other Cause	2	0	1	7	8
Total	21	6	7	30	43	

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Reduction in releases along the right-of-way reflects diverse strategies



Source: Pipeline Performance Tracking System, a voluntary spill reporting system involving 85% of the U.S. liquids pipeline mileage

Focus on Corrosion

- ✱ **Largest cause of ROW spills (46%)**
- ✱ **Reduced by 71% between 1999 and 2007**
- ✱ **56% are less than 5 barrels**
- ✱ **More important in crude oil systems than in refined product systems**
- ✱ **Billions \$ of investment have reduced**
 - ➔ **Inspection and repair in high consequence areas**
 - ➔ **First 5-year cycle is completed**
 - ➔ **Re-inspection for 2nd cycle now begun**

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Focus on Third Party Damage

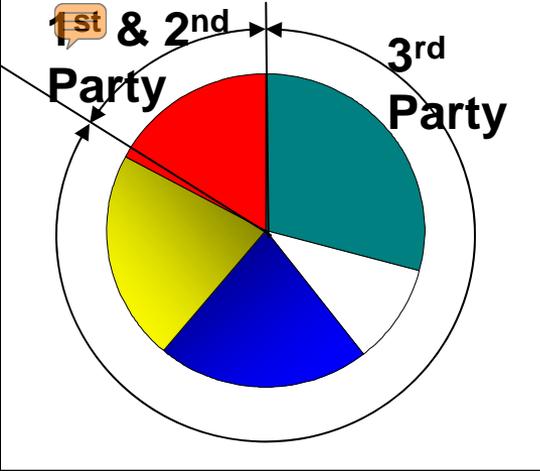
- ✱ **"Third party" is someone other than the operator (first party) or its contractor (second party)**
- ✱ **Excavation or other mechanical damage**
- ✱ **Not the greatest number, but the highest consequence**
 - **Almost 90% occur along ROW**
 - **Deaths, injuries**
 - ✓ **10 of 17 fatalities on ROW due to third party damage**
 - ✓ **17 of 43 injuries on ROW due to third party damage**
 - **Large spills**
 - ✓ **15% of ROW number, but 38% of ROW volume**

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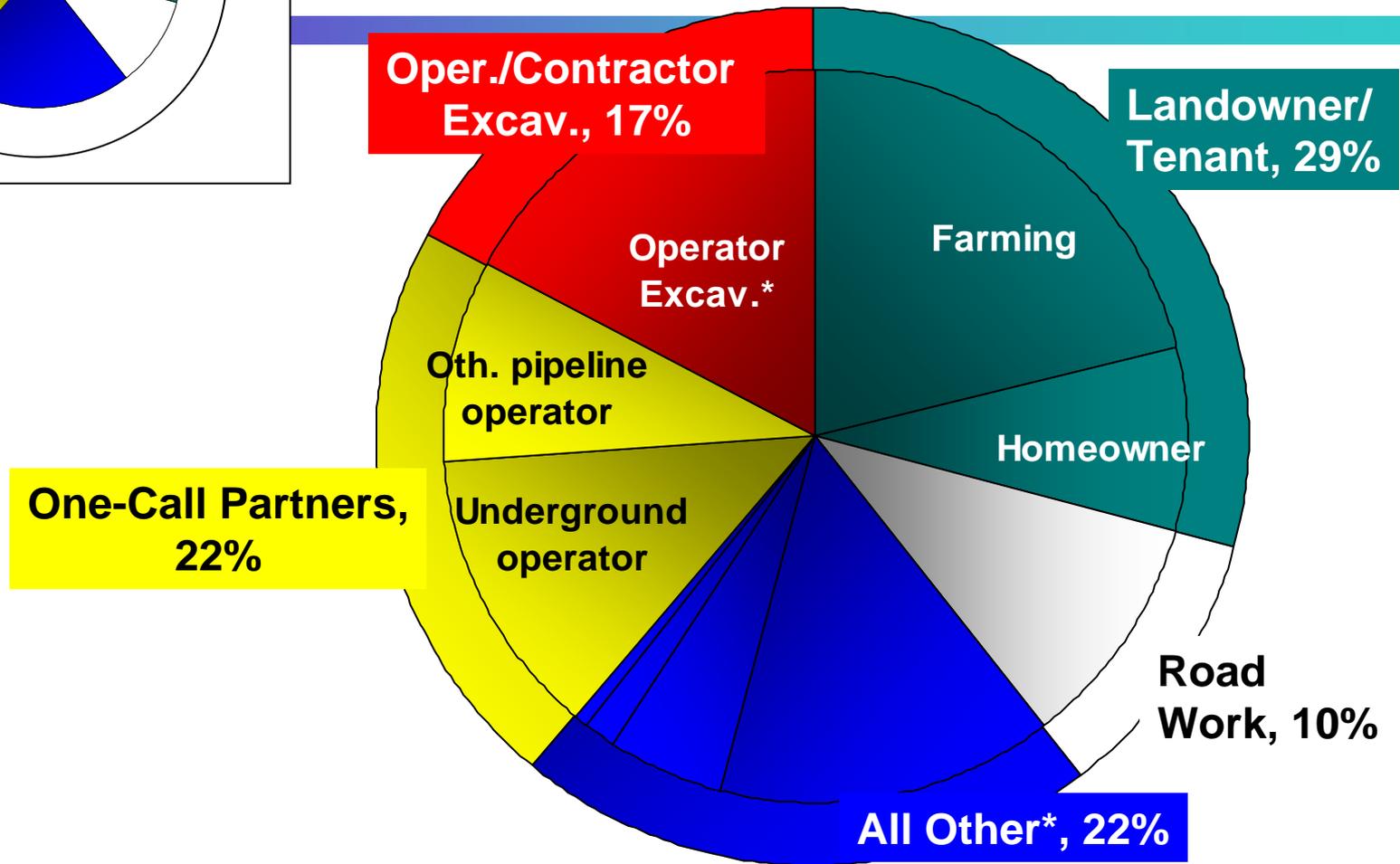
Who are these "third parties"?

- ✱ **Landowners (farmers, homeowners, tenants)**
- ✱ **Road construction crews**
- ✱ **Resid./comm'l development, etc.**
- ✱ **"One-call Partners" (pipelines and other underground utilities that pay for "call before you dig" systems)**

- ✱ **Can't forget first and second parties, though – the pipeline operator and its contractors**



Who does the damage? Not just excavators

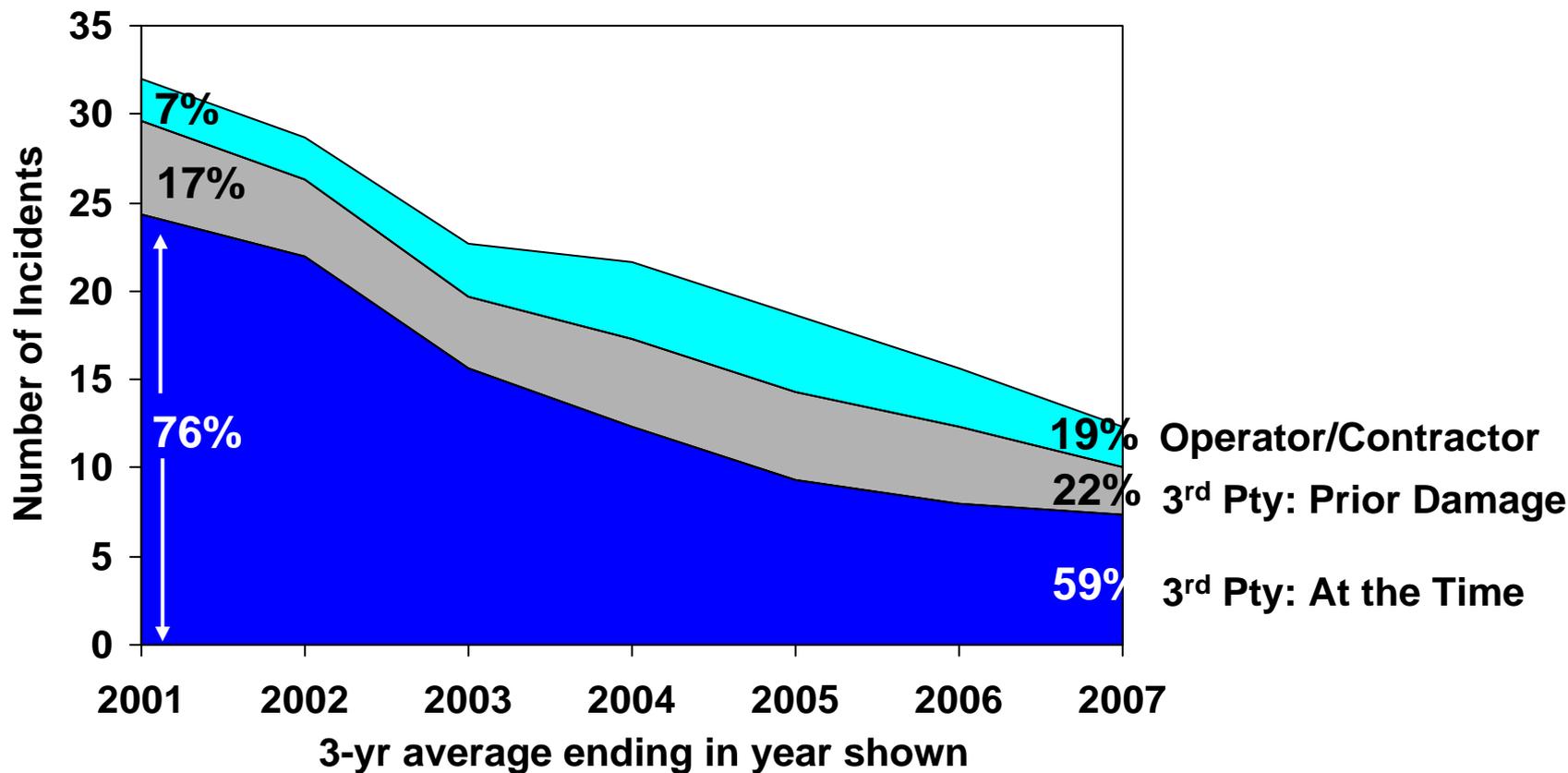


Onshore pipeline spills where: release occurred at the time of damage, and involving 5 barrels or more, or death, injury, fire or explosion.

Source: Pipeline Performance Tracking System, 1999-2007

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70% Decline in Third Party Hits Causing Immediate Failure

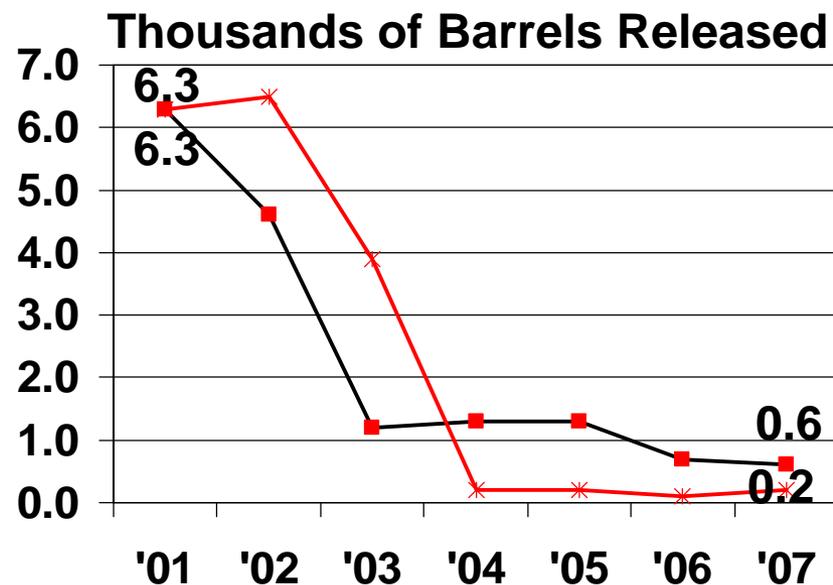
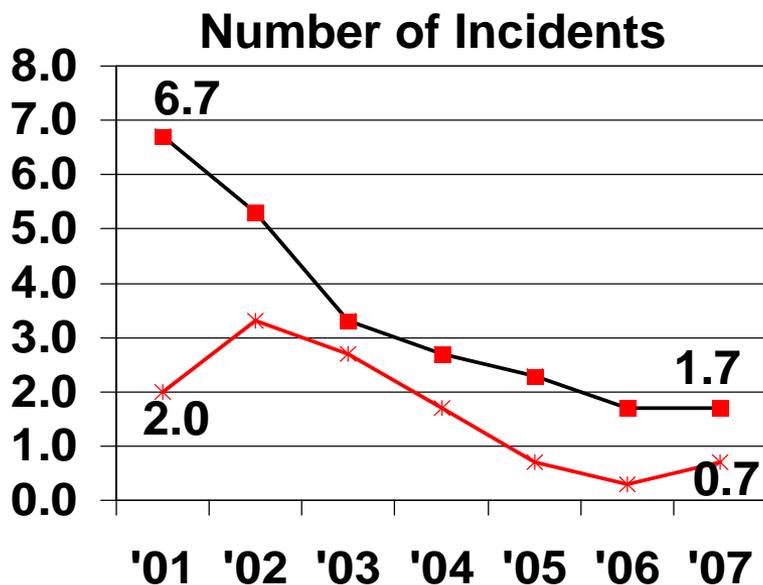


* Includes onshore pipeline incidents ≥ 5 barrels or death, injury, fire or explosion

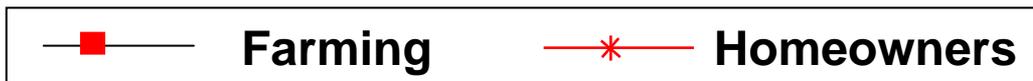
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Example of Declines 1999-2007

Incidents Caused by Landowner/Tenant Activity, 1999-2007



3-Yr. Averages ending in year shown



Recent Learnings: More detailed choices aid reporting

☀ **Operator Error: more Other Human Error**

- **Survey: more root cause analysis? Better understanding?**
- **Yes. Old categories don't provide a good reporting path**
- **Revise PPTS to increase -- and improve – categories**
 - ✓ **Reporters don't have to puzzle over category -- faster**
 - ✓ **Better consistency from incident to incident and operator to operator**

More detailed choices aid reporting (Facilities)

- ✱ **Facilities incidents require details: “granularity”**
 - **Different pieces of equipment, different failure mechanisms**
 - **Diverse industry groups to advise**
 - **More surveys**
 - **Improved categories, plus sub-categories**
 - **PRCI report**

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Data Mining Team

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