

## **PPTS OPERATOR ADVISORY: ROLE OF FIRST AND SECOND PARTY DAMAGE IN EXCAVATION INCIDENTS**

### **Executive Summary**

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This Advisory focuses on excavation damage to PPTS operator's assets caused by the operator itself (first party) or its contractor (second party). While not as numerous as third party incidents, these first and second party incidents have not declined as have third party incidents.

- First and Second Party Damage accounted for only 10% of the total of excavation damage incidents from 1999-2001, but was 36% of the total from 2005-2007.
- These incidents are primarily along the right of way (ROW) and 70% of them involve a contractor.
- They have resulted in the release of almost 7,800 barrels over this time period, almost all of it along the ROW.
- The largest incident, a release of 1,400 barrels, also involved an injury to a contractor.

Because operators have control over first and second party activities, they need to focus on internal practices and procedures in order to address the issues and ensure appropriate remediation. Areas of focus should include:

- Applying the same level of oversight, and using the same procedures, for excavations by company employees and contractors as are required for third parties.
- Ensuring that operating company personnel and contract personnel are properly trained for the tasks they are required to perform and are performing these tasks according to the appropriate guidelines.
- Providing contractor oversight as part of an operator's assessment of the effectiveness of its damage prevention program.
- Undertaking pre-job planning every time, and using all available information including updated drawings, maps, and inspection data showing appurtenances and fittings.
- Amending key drawings, maps, and other records to reflect any changes made in the field.
- Utilizing data developed through the incident report and investigation process to encourage continual improvement and avoid duplication of incidents.
- Establishing and monitoring useful performance metrics to measure the effectiveness of an operator's damage prevention program.
- Assessing excavation activity by first and second parties as a site-specific activity with unique excavation challenges and its own potential risks.

## Excavation Damage – Not Just Third Parties

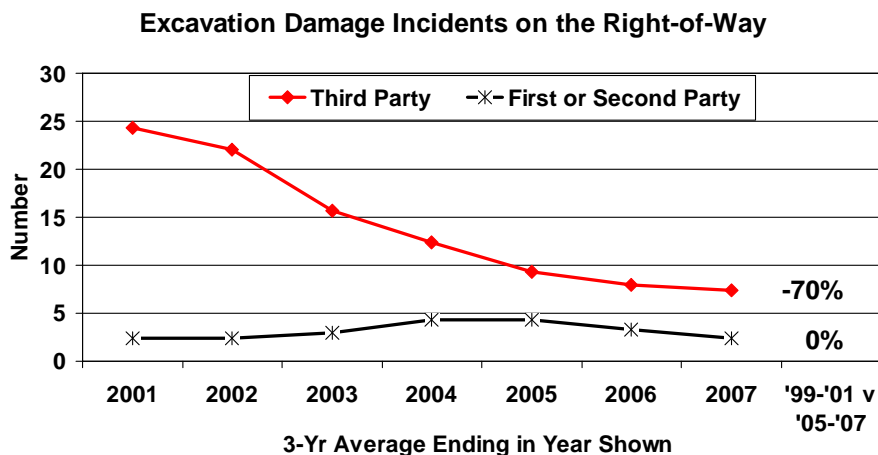
The PPTS data on release incidents resulting from excavation damage is collected and categorized as “first party,” “second party” or “third party” damage. This Advisory will focus on first and second party excavation damage: incidents that happen when an operator or operator’s contractor hits the operator’s own asset. This Advisory is one in a series of four covering excavation damage to hazardous liquids pipelines.

A “first party” is an employee or employees of the operating company. A “second party” is a person or persons acting on behalf of the pipeline operator, typically companies performing excavation or other maintenance activities under contract with the pipeline operator. While there are not as many operator excavation incidents as there are third party incidents, it is important to remember that the operator is not immune from causing excavation damage. Furthermore, while the number of operator error incidents is low, there has not been sustained improvement since 1999 when PPTS began collecting data. Additionally, some of these incidents have been large, with one resulting in an injury to a contractor.

### Trends in Excavation Incidents

The hazardous liquid pipeline operators that participate in PPTS and the pipeline industry as a whole have significantly reduced excavation-related incidents. Since 1999, there has been a 63% reduction in the total number of excavation damage incidents reported. However, until recently the decline has occurred in the incidents caused by third parties, not those caused by first or second parties – the operator or its contractors.

Operator Excavation (first and second party combined) represents approximately 17% of the total excavation-related incidents causing immediate failure reported to PPTS. In the 1999-2001 period, operator excavation accounted for less than 10% of the total, but in the



Includes incidents causing immediate failure and involving the release of 5 barrels or more, or death, injury, fire or explosion.

2005-2007 period, it accounted for 36% of the total. In 2006, there were no Operator Excavation incidents occurring on the right-of-way reported to PPTS. This improved performance was not sustained in 2007 however, with 4 Operator Excavation right of way (ROW) incidents reported<sup>1</sup>.

<sup>1</sup> To keep a consistent data set with the rest of the excavation damage series of Advisories, this Advisory will look only at the 1999-2006 data. The number of 2007 incidents was mentioned only to show that this is not a problem that has gone away.

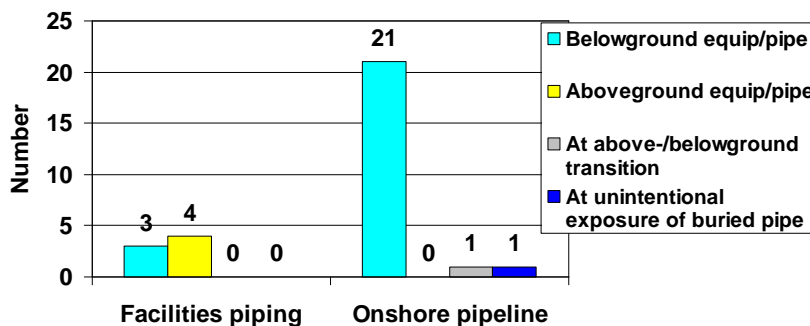
## PPTS Data Collection – Limitations of Operator Error Data

In PPTS, mechanical/excavation damage incidents caused by the operator or its contractor are classified as Operator Error. Over the period 1999-2006, there were a total of 30 operator excavation incidents reported. Only a release of 5 barrels or more, or a release involving a death, injury, fire, or explosion requires extensive long-form reporting. Thus, only those incidents provide detail on whether an Operator Error release involves operator excavation or some other type of error. The operator excavation incidents amounted to 17% of all Operator Error releases filed on the long form. It

is not possible to see how many of the 350 operator error incidents reported on the short form involved operator excavation. This is one of the reasons that the short form was eliminated in 2007.

In addition to the lack of data on short form incidents, the operator excavation question did not have any detailed questions on One Call and other excavation practices, thus limiting the lessons from this important cause category. The PPTS Data Mining Team revised the reporting form to capture more of this information beginning in 2009.

**Operator Excavation Incidents by Location, 1999-2006**



Incidents involving the release of 5 barrels or more, or death, injury, fire or explosion.

The discussion above in the section “Trends in Excavation Incidents” was limited to incidents occurring along the right-of-way because that is where 90% of excavation damage releases occur. However, there are also some incidents that occur inside a facility fence involving station piping or equipment. An Operator Error incident is classified as operator excavation if the operator checks the following category: “Excavation or physical damage to facility or pipeline by operator or operator’s contractor.” Thus, at least some of the incidents, particularly those that occur aboveground, may involve physical damage from something other than digging or other types of excavations.

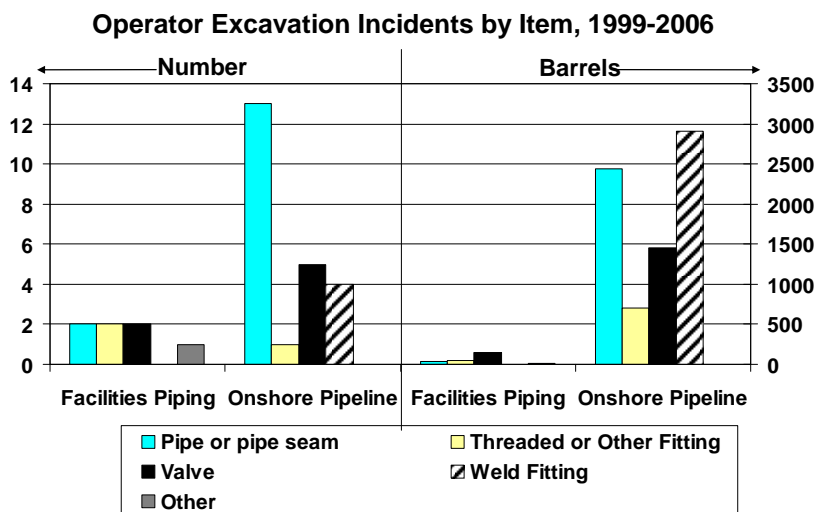
## PPTS Data Collection - Detailed Breakdown

There are several lessons to be gained even though the operator data set does not have as much detail as the third party data set.

During the period of 1999 through 2006, there were 30 Operator Excavation incidents reported to PPTS on the long form. This number represented roughly 1% of the total number of incidents reported to PPTS on the long form during that time frame. One of these releases resulted in an injury to a contractor. Two of these releases caused evacuations, with one of those being the injury-related release.

### Where?

The Operator Excavation incidents contain two distinct incident types: incidents in facilities and incidents on the ROW. The larger group is incidents on the ROW. Twenty-three (23) of the 30 incidents (77%) involved work on the ROW with all of the hazards associated with work in the



public domain. All but two of these ROW incidents took place on belowground piping. One of those other two took place at an unintentional exposure of buried pipe, such as one that might occur after heavy rains or as a result of soil erosion. The last took place at a transition point between above and belowground.

In the facilities incidents, over half took place on aboveground piping. It is logical to assume that these aboveground incidents did not involve excavation, but more likely some other form of physical damage caused by operator error. (Damage by vehicle is separately reported.)

### What Item is Involved?

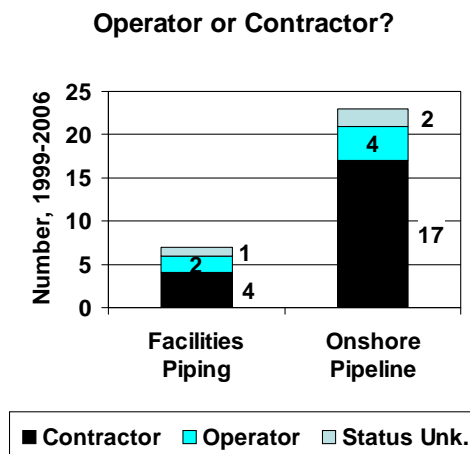
On the ROW, not surprisingly, pipe is the most often damaged item. Valves and fittings make up the rest of the damaged items on the ROW. In facilities, there is no one item damaged more than others. However, as can be seen in the chart below, weld fittings account for the greatest volume associated with operator excavation spills. There were 4 of these releases; they ranged from 200 barrels to 1,400 barrels. (The 1,400-barrel release also involved an injury to a contractor.)

### How much is spilled?

A total of 7,767 barrels were released during these 30 operator excavation release incidents. The largest spills are on the ROW. The median spill size for all 30 releases was 76.5 barrels. However, when the 7 facility releases are taken out of the picture, the median more than doubles to 183 barrels. The facility spills accounted for only 261 barrels of the 7,767 barrel total. This reinforces the idea that while the industry must work to reduce facility spills, there needs to be continued focus on incidents along the ROW.

### Damaging Parties – First or Second Party?

Contractors are involved in 70% (21) of Operator Excavation Damage releases. This is the opposite of the other operator error categories where contractors are only involved in 23% of the incidents. The



contractor share rises to 74% for ROW incidents, and is 57% for incidents occurring in facilities piping. The reasons behind this are unclear. One explanation may be that contractors are used for excavation (particularly for traditional excavation on the ROW) more often than they are for other tasks.

## Considerations for Operators

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The data presented above demonstrate that the frequency of operator excavation damage incidents is low, but has not shown sustained improvement in recent years. Operators may need to look to new strategies or to apply current strategies differently.

### *Operator Excavation Damage Prevention – Focus Inward*

- ❖ The prevention of Third Party Damage has an outward focus, particularly through damage prevention public education, pipeline location awareness, and One-Call Center outreach. Conversely, the prevention of Operator Excavation damage has an inward focus. Prevention of Operator Excavation damage focuses on operator practices, including employee training, excavation and safety procedures, and contractor oversight.
- ❖ Since an operator has control over first and second party activities, analysis of incident experiences including near misses and operating practices is essential to avoid operator excavation/mechanical damage incidents. Analysis could include:
  - Written damage prevention and excavation procedures that incorporate best practices and industry standards, such as CGA Best Practices.
  - Performance metrics, industry benchmarking and frequent assessments of the results of the operator's damage prevention program,
  - Incident investigations that identify root causes and systemic issues and incorporate the lessons learned into operator practices, and
  - Information presented at industry forums and PPTS Operator Advisories to share lessons learned and obtain data to target damage prevention efforts.
- ❖ Programs that ensure that direct company personnel and contract personnel are properly trained for the tasks they are required to perform and are performing these tasks according to the appropriate guidelines are essential. For assets subject to PHMSA jurisdiction, this is already required through the operator qualification regulations. The effectiveness of such programs can be assessed through the use of company and industry incident data, contractor incident data, near miss history, and root cause analyses.
- ❖ More than two-thirds of the operator excavation incidents reported to PPTS involved contractors. Contractor oversight programs may need to be included as part of an operator's assessment of the effectiveness of its excavation damage prevention program.

### *Information is Power*

- ❖ Preventing damage to operator assets is also a function of assessing known information prior to beginning field excavation activities. Useful tools include:
  - Updated facility or pipeline alignment drawings,
  - Information pertaining to other items such as the locations of abandoned, idled, or parallel assets that may be in the vicinity of the planned excavation, and
  - In-line inspection data that includes locations and orientations of appurtenances such as valves, fittings, taps, etc.

- ❖ Such information, when used in conjunction with proper field location and marking techniques, can help avoid damage due to a miscommunication of known information. Therefore, proper procedures to address the distribution of such materials and to update information in a timely fashion are essential.

***Pre-Job Site Analysis & Review***

- ❖ Excavation by first and second parties is ultimately a site-specific activity. Each location contains its own unique excavation challenges and has its own potential risks. Operators should consider the following activities at all excavation sites:
  - Perform pre-job site safety analyses to identify potential risks and safety issues..
  - Hold tailgate training sessions to cover excavation procedures, review risks, and disseminate this information to the company and contract personnel that will be working at the site.
  - Modify the hazard assessment if site conditions and/or personnel change.
  - Verify the adequacy of the available information such as in-field markings, markings related to third party One-Call response, pipeline alignment or facility drawings, in-line inspection information, etc.



The petroleum pipeline industry undertook a voluntary environmental performance tracking initiative in 1999, recording detailed information about spills and releases, their causes and consequences.

The pipeline members of the American Petroleum Institute and the Association of Oil Pipe Lines believe that tracking and learning from spills improves performance, and demonstrates the industry’s firm commitment to safety and environmental protection by its results.

This is one in a series of Advisories based on the Pipeline Performance Tracking System, "PPTS."

NOTE; The “Considerations for Operators” in this document represent the experience of a limited number of subject matter experts from a variety of liquids pipelines operators. They were not developed under the process prescribed by the American National Standards Institute and do not represent a Standard or a Recommended Practice of the API or its member companies.

For additional information on PPTS and its lessons for the oil pipeline industry, please see [www.api.org/ppts/](http://www.api.org/ppts/). Click on the “documents” link in the left frame to see other Operator Advisories. Of particular interest will be the following:

| <b>Title</b>  | <b>Date</b>    | <b>Number</b> |
|---|----------------|---------------|
| PPTS Operator Advisory: More to Do on Excavation Damage                               | Sept 2008      | 2008-4        |
| PPTS Operator Advisory: Role of First And Second Party Damage in Excavation Incidents | May 2009       | 2009-1        |
| PPTS Operator Advisory: Landowner/Tenant Activity Impact on Third Party Damage        | In preparation |               |
| PPTS Operator Advisory: Focus on One-Call Partners                                    | In preparation |               |