Mechanical Fitting Failures

Reporting and Data Analysis
MFFR Reporting

- § 191.12 Distribution Systems: Mechanical Fitting Failure Reports. Each mechanical fitting failure, as required by § 192.1009, must be submitted on a MFFR Form PHMSA F–7100.1–2.

- Must submit for previous calendar year.

- May elect to submit its reports throughout the year.
  - (Developing tool for batch uploads)

- Must also report this information to the State pipeline safety authority if applicable.
Reporting and Data Analysis

- Communication of Performance Data through DIMP web page

- The MFFR instructions have been revised.

- Failures resulting from a construction or installation defect should be identified with the “Incorrect Operations” leak cause and not the “Material or Welds/Fusions” leak cause category (as is described in PHMSA F 7100.1-2 and the Instructions).

- See Advisory Bulletin (ADB-2012-07) [77 FR 34457] pages 34457 -34458
INSTRUCTIONS FOR COMPLETING FORM PHMSA F 7100.1-2

- Make an entry in each block for which data are available. Some companies may have very old pipe for which installation records do not exist. 
  
  *Estimate data if necessary.* Avoid entering “Unknown” if possible.
Mechanical Fitting Failures by Material

2011:
- Brass: 62.75%
- Combination Plastic and Steel: 4.13%
- Other: 5.36%
- Plastic: 24.84%

2012:
- Brass: 60.99%
- Combination Plastic and Steel: 1.93%
- Other: 1.24%
- Plastic: 5.90%
- Steel: 2.54%

2013:
- Brass: 84.62%
- Combination Plastic and Steel: 2.28%
- Other: 0.57%
- Plastic: 7.02%
- Steel: 0.33%
- Unknown: 7.38%
Mechanical Fitting Failures by Cause

<table>
<thead>
<tr>
<th>Leak Cause</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosion</td>
<td>328</td>
<td>384</td>
<td>9</td>
</tr>
<tr>
<td>Equipment</td>
<td>3504</td>
<td>2989</td>
<td>108</td>
</tr>
<tr>
<td>Excavation Damage</td>
<td>229</td>
<td>264</td>
<td>6</td>
</tr>
<tr>
<td>Incorrect Operation</td>
<td>572</td>
<td>802</td>
<td>7</td>
</tr>
<tr>
<td>Material or Weld</td>
<td>1036</td>
<td>1087</td>
<td>19</td>
</tr>
<tr>
<td>Natural Forces</td>
<td>1558</td>
<td>1181</td>
<td>63</td>
</tr>
<tr>
<td>Other</td>
<td>1004</td>
<td>703</td>
<td>81</td>
</tr>
<tr>
<td>Other Outside Force Damage</td>
<td>105</td>
<td>79</td>
<td>6</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>8336</strong></td>
<td><strong>7489</strong></td>
<td><strong>299</strong></td>
</tr>
</tbody>
</table>

**Pie Charts for 2011, 2012, and 2013**

- **2011**
  - Corrosion: 18.69%
  - Equipment: 42.03%
  - Excavation Damage: 12.43%
  - Incorrect Operation: 12.04%
  - Natural Forces: 6.86%
  - Other: 3.93%
  - Other Outside Force Damage: 2.75%

- **2012**
  - Corrosion: 15.77%
  - Equipment: 39.91%
  - Excavation Damage: 10.71%
  - Incorrect Operation: 9.39%
  - Natural Forces: 3.53%
  - Other: 14.51%
  - Other Outside Force Damage: 2.01%

- **2013**
  - Corrosion: 27.09%
  - Equipment: 36.12%
  - Excavation Damage: 21.07%
  - Incorrect Operation: 2.34%
  - Natural Forces: 2.01%
  - Other: 6.35%
  - Other Outside Force Damage: 3.01%
Specify the Mechanical Fitting Involved

- Stab Type
- Nut Follower
- Bolt Type
- Other(s)
Mechanical Fitting Failure by Type

The bar chart shows the number of fitting failures by type and year, from 2011 to 2013.

- **Service or Main Tee**: 472 (2011), 492 (2012), 13 (2013)
Mechanical Fitting Failures by Type
Failures By Leak Location

2011
- Aboveground: 0.01%
- Belowground: 16.28%
- Belowground, Belowground: 83.71%

2012
- Aboveground: 13.63%
- Belowground: 86.37%
- Belowground, Belowground: 97.99%

2013
- Aboveground: 2.01%
- Belowground: 97.77%
- Belowground, Belowground: 90.64%

Legend:
- Inside
- Outside
- Outside, Outside
Dakotas / Wyoming Data
Day of Week of Failures

Percent

Sunday  Monday  Tuesday  Wednesday  Thursday  Friday  Saturday
MFFR Data Analysis

- Raw data received through March 22, 2013 is presented here.

- MFFR Team has begun QA/QC the data and initiated analysis.

- Preliminary analysis of the data is posted on the DIMP Website.

- Two years data a trend does not make
Data Summary

- Confirmation of information
  - The decade of installation
  - States with the most mileage
- Majority of issues couplings
- Belowground, outside and service to service
- Plastic or combination fittings higher risk for incorrect operation or material/weld
- Steel fittings higher risk for equipment as cause