# Effectiveness of Industry Initiatives: Change in Leak Incidence Rates

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# Agenda

- Objective

- Problem

- Conclusion

# Objective

- **Determine Effectiveness of Initiatives**
  - Consider
    - Leaks from pipe and tanks
      - Safety related
      - Contain hazmat (environmentally sensitive)
      - Contain radioactive material (by design or contamination)

# Objective

- Determine effectiveness of initiative (cont)
  - Expect
    - Pre 2009 – some number of leaks
    - 2009 – 2013 – higher number of leaks
      - Inspection transient
    - Post 2013 – lowest number of leaks
      - Improved piping/maintenance
  - Must be demonstrated

# Problem

- How to determine leak rates
  - Three sources
    - EPIX
    - NEI survey results
    - NRC groundwater contamination
  - Not in complete agreement
  - EPIX reporting criteria changed in 2009
    - New data inconsistent with old

# Problem

- EPIX data base categories, Buried Pipe
  - Component
    - Pipe, Fitting, Rupture Disk
  - Engineering Characteristics
    - Safety related
    - Contains environmentally sensitive fluid
    - Contains radioactive material
    - Run to failure
    - Not run to failure

# Problem

- EPIX data base categories, Buried Pipe
  - Failure mode
    - Significant leak
    - Leak
    - External leak
    - Adverse inspection finding
    - Other degradation
    - Other
  - 194 total entries as of May 2011

# Problem

- NEI data base categories
  - Leaks from
    - Safety related
    - Contains radioactive
    - Contains environmentally sensitive

  - 78 entries 2007-2010

# Problem

- Total leaks by year
  - EPIX data not limited to safety related, radioactive, environmentally sensitive
  - As of spring 2011

| Year | INPO Data | | | NEI Data |
|------|-----------|-----------------|-------------|----------|
|      | Leak | Significant Leak | Total Leaks |          |
| 2007 | 10   | 0 | 10  | 11 |
| 2008 | 1    | 0 | 1   | 13 |
| 2009 | 62   | 7 | 69  | 19 |
| 2010 | 57   | 5 | 62  | 35 |
| Total | 130 | 12 | 142 | 78 |

# Problem

- Safety related, radioactive, environmentally sensitive leaks by year
  - As of spring 2011

| Year | INPO Data – Leaks (Not Fun to Failure, Other) | | | | NEI Data |
|------|-----------------------------|-------------|-------------------|-------------|----------|
| | Environmentally Sensitive | Radioactive | Safety Relevant | Total Leaks | |
| 2007 | 0 | 0 | 0 | 0 | 11 |
| 2008 | 0 | 0 | 0 | 0 | 13 |
| 2009 | 10 | 5 | 2 | 17 | 19 |
| 2010 | 1 | 3 | 3 | 7 | 35 |
| Total | 11 | 8 | 5 | 24 | 78 |

# Problem

| Year | INPO (verbal) | EPIX (all categories) | EPIX (safety rel., rad., env.) | EPIX (keyword) | NRC* (groundwater) |
|------|------|------|------|------|------|
| 2000 | 2 | 2 | 1 | 0 | 1 |
| 2001 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 2 | 2 | 0 | 2 | 2 |
| 2004 | 2 | 2 | 0 | 5 | 1 |
| 2005 | 5 | 5 | 0 | 1 | 2 |
| 2006 | 0 | 1 | 0 | 0 | 5 |

* Not necessarily buried pipe leaks

- Older data does not compare well

# Problem

- Categorization issues
  - Significant leak of safety related service water reported as non leak
  - Leak of condenser (24,000 pC/l tritium) reported as buried pipe "run to failure"
  - Sodium hydroxide leak reported as buried piping "run to failure"
  - Essential service water leak reported as buried piping "not run to failure"

# Conclusion

- Data sources are inconsistent with each other

- Data sources contain some examples of miscategorizations

- Pre-2009 data reporting basis inconsistent with later data

- Very difficult to compare data from different sources

# Conclusion

- Evaluation of existing data has not revealed a useful pre 2009 leak rate

- Comparison with 2009-2013, and post 2013 leak rates may not be productive

- Need to establish a pre-inspection transient rate as a metric for comparison

- Seeking input