Distribution Integrity Management Review

2014 Pipeline Safety Conference

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Topics Areas for Discussion

- Virginia's experience
- Inspection Results and Findings
- Safety Culture

Virginia's Experience

History

Virginia's Experience

DIMP Inspections

Results and Findings

Discussion Items

1. Procedures
2. Knowledge of System Data
3. Threat Identification
4. Potential Threat Evaluation
5. Performance Measures
6. Risk Model

DIMP is a Dynamic Process

- Many plans are static
- Procedures are general in nature
- Review process does not include procedures

Importance of Procedures

- If the procedures are not detailed enough to ensure the consistency of the completion of tasks, the procedures are inadequate and the process cannot be completed effectively.

- Example – Selection of SME's

How are SME's involved in DIMP?

- Knowledge of the System
- Identify Threats
- Evaluation and Rank Risks
- Evaluate Effectiveness
- Periodic Evaluation and Revision as Needed

SME's are a key component for DIMP for most operators.

Selection and Qualification of SME's

- What is an SME?
  - PHMSA defines a Subject Matter Expert (SME) as "an individual recognized as having a special skill or specialized knowledge of a process in a particular field, or of a piece of equipment."
  - Does the Operator's plan identify the special skill/knowledge?
  - What kind of metrics/criteria are used?

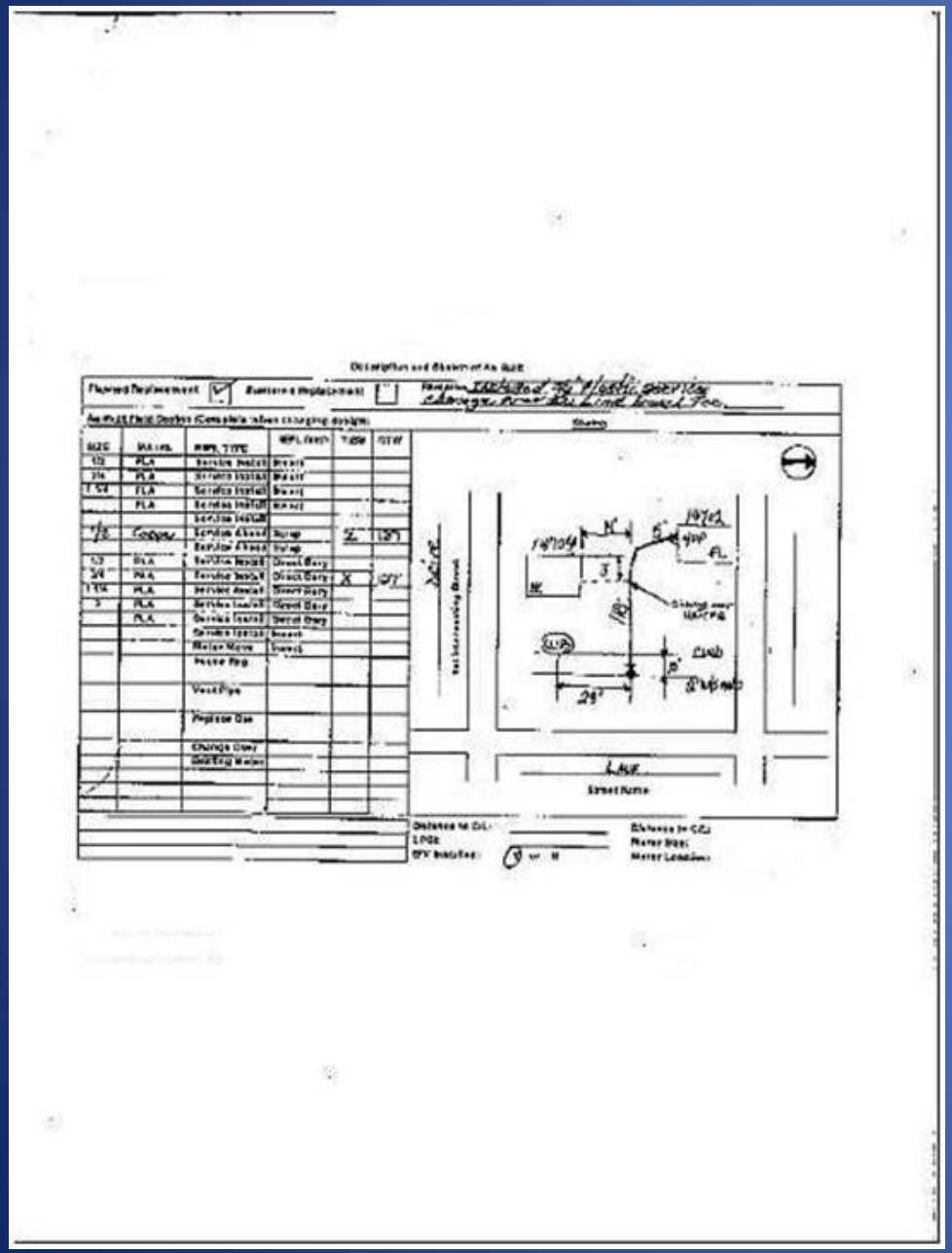
Knowledge of the System

- Initial Data Collection
- Data Gaps
- Determination of Data Needed to Evaluate Threats

Knowledge (continued)

- Specific source data and documents used in development and implementation of DIMP must be included in DIMP.
- Procedure for collection of additional or missing information must be documented.
- Plan must list data that the Operator has identified that is needed to fill gaps.
- Plan must include procedure for recording new pipe data, including location and materials used.

Existing Records



When developing the knowledge of system data for DIMP, was the system information cross referenced? For example, were service cards compared with the other system data such as main installation data and leak repair data to crosscheck accuracy of the system?

Leak Data

- Is the data being categorized correctly?
- How do you ensure data collected in the field is accurate?
- How do you ensure that the data is being entered into a database accurately?

Importance of Accurate and Complete Data

Data Capture for New Facilities

- When facilities are being installed there is an opportunity to capture data covering many threats –
- Even though identified threats may involve more than location and material type, a number of DIMP plans simply restated the PHMSA requirement.

Review Data Collection Process

- Leak Repairs require Failure Investigation
- What data was recorded during new construction?
  - Was it adequate?
  - Does the data capture process need revision?
- If threats arise in the future, can they be tracked back to a certain location, equipment, material or individual?

Quality of Data

- Accuracy
- Organization
- Level of collection
  - Historically to Present
  - Process for changes
  - Use of external sources

Quality of data (continued)

- Data quality an issue
  - Incomplete and/ or obvious errors.
  - Older databases difficult to query or do not communicate with other database systems.
  - Data verification must be done.

- Once the data was scrubbed, the threat identification was not re-evaluated.

- QA/QC checks should be run to ensure incoming data is accurate (e.g., categorizing leaks, determination of probable cause, accurate pipe type and facility information)

QA/QC for data

- Installation or repairs require completion of paper or electronic records.
- The documentation is prepared and submitted as required by the company procedure.
- The information becomes part of the system knowledge for DIMP processes.
- We found either no, or very limited, data quality checks along the way.

Threats

Once the knowledge of the system is completed, its time to determine threats to the system

Threats

- Threat identification requires integrating multiple sets of data
  - Records from O&M activities
  - Records from Construction activities
  - Records from Special projects
  - Maps
  - External Information
  - Additional Information

Threat Identification – Going Through the Motions

- However, where do the unique characteristics of your system come into play?
- Threat identification is one of the most important steps to creating a unique integrity plan that addresses your specific issues.
- Are all field employees involved in threat identification?


DO NOT BLOCK DOOR

Interactive Threats

- Examples of interacting threats include:
  - Cracking in older plastics where pipeline was squeezed off or where over-squeeze occurred due to improper tools or procedure
  - Cracking at hand stabbed tapping tees
  - Water main leakage areas or areas of soil subsidence with cast iron mains
  - Installation of mechanical fittings without restraint in soils or conditions (excavation damage) that allow pipe to pull out of fitting

Potential Threats

- Most Operators did not identify potential threats very well
  - Gouges on pipe
  - Excavation damage and fusions
  - Threats that endangered facilities but have not resulted in a leak (e.g., exposed pipe, near misses).
  - Non-leak threats (overpressure, exposure)
  - Manufacturing and Construction Threats
  - Incorrect Facility Maps

Excavation Damage

Inadequate Cover

Potential Threats

Examples of potential threats that many operators have not considered:

- Over pressurization events
- Regulator malfunction or freeze-up
- Cross-bores into sewer lines
- Materials, Equipment, Practices, etc. with identified performance issues
- Vehicular or Industrial activities
- Incorrect maintenance procedures or faulty components
- Wood borers or Mice eating into plastic pipe

Subdivision of Areas for Threats

- Example:
  - Company has specific area of Aldyl-A developing cracks
    - However, the DIMP Risk involves ALL Aldyl-A
  - Coating issues are found in certain areas of the system, yet, all pipe with that coating is ranked the same
- System Specific or Area Specific

Threat Identification

- Identifying the Threat Characteristics
  - Actual
  - Potential
- Challenges
  - The Unknown

Data Capture to Address Threats

- What information should be captured?
  - Example: Plastic pipe
    - Is this Aldyl-A , Plexco, Polypipe, Central, Perfection, Marlex, medium/high density?
  - Example: Soil Type
    - Bentonite

Risk Models – Likelihood, Consequence

- Everyone involved in Integrity Management knows the formula:

  Risk = Likelihood x Consequence

- But how do we determine Likelihood? Or Consequence? Are we really considering Consequence, if, for example, we apply a range of 0 to 1 for consequence and everything is rated as 1 ?
- Is there enough information being collected to properly consider the consequences of leak repairs or pipeline incidents appropriately?

Evaluation of Threats

- Likelihood
  - Only Includes Actual Threats
- Consequence
  - Class Location Main Consideration
- Incomplete Process
  - Only ranked “top 10” or “top 20” or “top 50” risks
  - Accelerated action plan for improvement only included those “top” risks

Performance Measures

- Do the performance measures provide the necessary feedback for the company to review the effectiveness of the DIMP plan and make any changes required to improve the process?

Performance Measures

- Examples
  - Performance was bad if there was an increase. However, **any** increase, whether 0.1% or 200% had the same effect on the plan
  - No consideration was given for performance measures that remained constant from year to year
  - No re-evaluation of performance measures required by the company's DIMP plan.

Revision of Plan

- Does the plan contain a process by which the program will be reviewed periodically and refined and improved as needed?

Communication

- Changes to procedures.
- Changes to plan.
- Ensuring all levels of employees know their responsibilities relative to DIMP.
- Lines of Communication for individual responsibilities, required task performance, and plan revision updates MUST be part of the DIMP plan.

Risk Management

- The pipeline safety arena has changed - forever
  - Growing public intolerance to risk – yet highly rate sensitive
  - Media attention has increased
  - Social media (without editorial control)

- Pipeline safety must move from a “checkbox”, i.e., do you have a procedure? to understanding data and information and promptly acting to reduce risks

Safety Culture

Safety Management System Protocol under development - RP1173 - includes safety culture

Safety Culture is the collective set of attitudes, values, norms and beliefs, which pipeline operator's employees share that demonstrate a commitment to safety over competing goals and demands.


DO NOT BLOCK DOOR

Safety Culture (continued)

- Critical elements of a strong safety culture:

1. Embraces safety (personnel, public, and asset)
2. Ensures everyone understands the organization's safety culture goals,
3. Inspires, enables, and nurtures culture change when necessary,
4. Allocates adequate resources to ensure individuals can successfully accomplish their safety management system responsibilities,
5. Encourages employee engagement and ownership,
6. Fosters mutual trust at all levels, with open and honest communication,
7. Promotes a questioning and learning environment,
8. Reinforces positive behaviors and why they are important ,
9. Encourages non-punitive reporting and ensures timely response to reported issues.

Recent Accidents Have Demonstrated Weaknesses in Managing Risk

- Weaknesses identified include ***inadequate***:
  - Knowledge of pipeline risk characteristics including recordkeeping
  - Processes to analyze interactive threats
  - Evaluation of ways to reduce or mitigate consequences
  - Process to select P&M measures
    - Lack of objective, systematic approach

Summary

- DIMP Plans must have clear, concise, procedures with defined results and measures.
- The DIMP process must allow information to flow from the top to the bottom as well as bottom to top.
- Improving the Safety Culture impacts system integrity and facilitates DIMP

How to Properly Manage the Risk?

- Develop a dynamic DIMP process that includes:
  1. Development of a plan to improve the integrity of a system
  2. Follow the procedures within the plan
  3. Evaluate the results of the completion of the procedures
  4. Revise the plan as necessary and go back to step 2

Plan, Do, Check, Act

Questions?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