

From Filing Cabinet to Integrity Management Resource Collecting Useful Data

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2007 ESRI Electric and Gas User Group

Integrity Management - Collecting Useful Data

- Regardless of Business Driver, Integrity Management is a Best Practice
- Examples are Related to Pipelines, but Applicable to Utilities Also
- Enterprise Facility and Integrity Management GIS Databases
- Traditional Data Collection Efforts
- Integrity Management Data Requirements
- Forms Applications
- Collecting Data From Existing Paper Documents
- Survey Data Collection

Enterprise GIS Databases

- Should Cover both Facilities and Integrity Management
- Gas Transmission Database Models
 - ESRI's ArcGIS Pipeline Data Model APDM
 - Pipeline Open Database Standard PODS
- Gas Distribution Database Models
 - ArcGIS Gas Distribution
- Electric Transmission Database Models
- Electric Distribution Database Models
- Linear Referencing vs. Network and Geographic

Traditional Data Collection Efforts for Pipeline Operators

- In-Line Inspections
- Physical Inspections
- Repair Documentation
- Patrol Logs
- Crossing Reports
- Aerial Patrol Surveys
- Leak Reports
- GPS Surveys
- Pre-Construction Surveys
- As-Built Surveys

Integrity Management Data Requirements

- Data Must Have a Spatial Reference
- Geographic
 - Line Identifier
 - XY Coordinates



- Linear Referencing
 - Line Identifier
 - Line Stationing Point and Linear Events

Integrity Management Data Requirements

- In-Line Inspection Data
 - Use a Data Alignment Application
- Physical Inspection Data
 - Collect from Field with Line ID and XY or Station Number
- Repair Data
 - Collect from Field with Line ID and XY or Station Number
- Maintain Relationships between In-Line Inspections, Physical Inspections, and Repairs
- Existing Paper Document Data Collection
 - Collect with Line ID and Station Number
- Facility Data from GPS, Pre-Construction, and As-Built Surveys
 - Collect XY along with Line ID and Station Number

Data Alignment - In-Line Inspection Data

Create a Spatial Reference by Converting Odometer to Stationing

Control Data

Survey Data

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Publishing the In-Line Inspection Data



Forms Application - Physical Inspection Data Collection

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Forms Application - Repair Data Collection

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Forms Application – Paper Document Data Collection

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Forms Application – Workflows and Form Approval



Forms Application – Managing the Digital Forms

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| My Tasks | | | | | |
| Description | Туре | Status | Revised | User | |
| Jim's inspection | Facility Inpect and Repair | Submitted | 10/25/2006 | phan | |
| Pipe inspection | Maintenance Record | Incomplete 💌 | 10/24/2006 | phan 🎽 | * |
| Facility inspection | Facility Inpect and Repair | Approved Complete | 10/24/2006 | phan | 2 |
| Earl's Inspection | Visual Inspection and Foreign Line Crossing | In Process | 10/24/2006 | phan | |
| Repair after break | Pipeline Inspect and Repair | New | 10/18/2006 | phan | |
| Recoat of East line | Pipeline Inspection and Repair | Submitted | 10/11/2006 | phan | |
| Inspection of pipe under I-85 | Maintenance Record | New | 10/26/2006 | phan | |
| Bill's repair to pump 3 | Visual Inspection and Foreign Line Crossing | New | 10/26/2006 | phan | |
| Jim's South bend inspection | Facility Inpect and Repair | Incomplete | 9/25/2006 | phan | |
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Forms Application – Publishing the Data



Survey Data Collection - Intelligent Survey Forms

- Separate into Features
- Collect Attributes Feature by Feature
- Use "Required" Fields Whenever Possible
- Use Coded Drop-Down Lists
 - Use for Line Identification
 - Use for Type Codes
- Format Text Fields with Length
- Limit the Number of Text Fields
 - Use for Comments
 - Use for Facility Serial Numbers
 - Use for Facility Names and Descriptions
 - Use for Road Names, Waterway Names, etc.
- Format Numeric Fields with 00.00
 - Station Numbers
- Collect Lines as a Series of Points

Survey Data Collection - Survey Procedures

- Document All Survey Procedures
- Consult Survey Managers and Crews when Writing Procedures
- Conduct Training for Survey Crews
- Get Buy-In from Survey Managers and Crews
- Go To the Field and Verify Procedures
 - Eliminate Inefficiencies
 - Make Job Easy for Surveyors
- Collect Lines as a Series of Points
 - Pipelines PI to PI
 - Electrical Transmission Lines Pole to Pole
 - Crossings 2 or 3 Points
 - Anything that Goes Along the Right-of-Way
 - Avoid Meandering

Survey Data Collection - Post-Processing Survey Data



Survey Data Collection - Loading Survey Data

- Plan the Survey
- Create Intelligent Forms Data Dictionary
- Write Procedures
- Train Survey Crews
- Collect Only What You Need
- Perform Post-Processing
- Do All of This, and Loading the Data is Easy

Integrity Management – Analyze the Data



Integrity Management

- Good Data Makes it Easy
- Track Efforts from Beginning to End
- Perform Relational Analyses
- Perform Spatial Analyses
- Focus on Good Reporting

Integrity Management - Reporting





From Filing Cabinet to Integrity Management Resource Questions and Answers

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