National Pipeline Mapping System
An
Operator's Perspective

Presentation at the PHMSA Public Workshop

National Pipeline Mapping System

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Ameren
ILLINOIS

DISCLAIMER

- The pipeline operations of local distribution operators are very diverse.

- The actions proposed to address the changes to the National Pipeline Mapping System depend on the specific characteristics of the pipeline system and current GIS data.

- The actions proposed will vary with different operators.
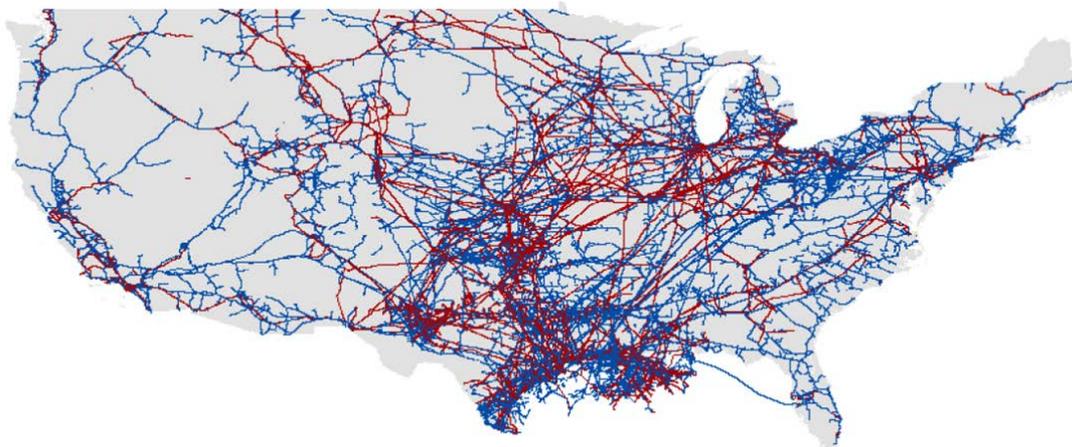
Agenda

- Ameren Illinois Background
- What Information is currently in Ameren Illinois' Mapping System
- What Active Steps are Underway to Update Information
- Timeframe and Resources Required
- Challenges in Meeting PHMSA's Request
- Summary

AMEREN ILLINOIS BACKGROUND

- Regulated electric and gas delivery company based in Collinsville, Illinois

- Parent company is Ameren Corporation located in St Louis, Missouri

- Service territory spans 43,700 square miles, or about three quarters of the State of Illinois

- Deliver safe, reliable energy to more than 1,200 communities serving 1.2 million electric and 806,000 natural gas customers in central and southern Illinois

- Gas delivery system includes approximately 1,250 miles of transmission pipelines, 16,950 miles of distribution mains and 12 underground natural gas storage fields

- Peak day delivery of 1,385,000 MCF and with an annual throughput of 155 BCF

AMEREN ILLINOIS SERVICE TERRITORY
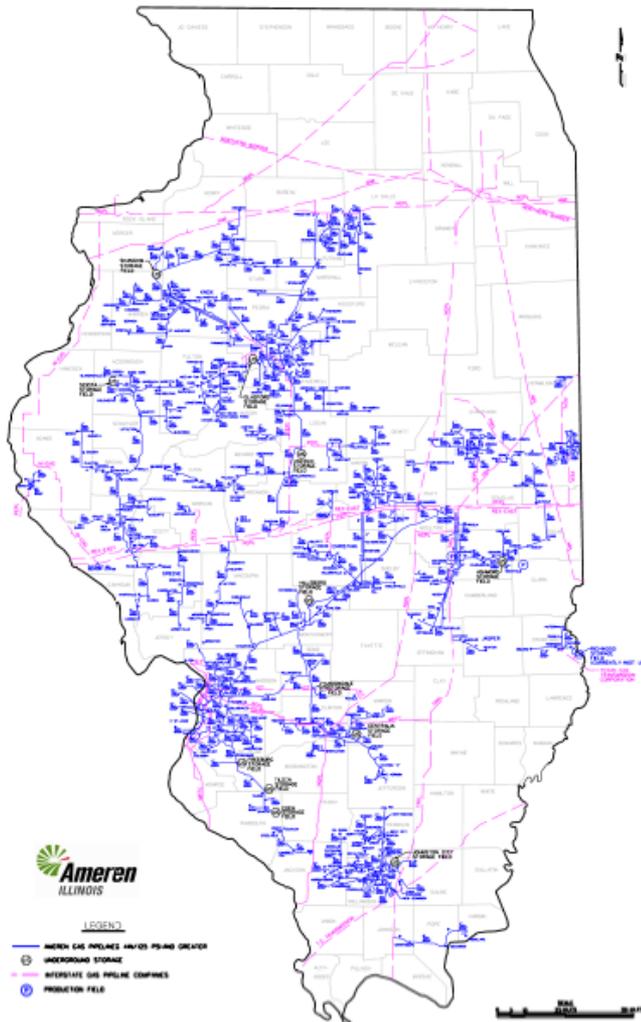
AMEREN ILLINOIS TRANSMISSION PIPELINE SYSTEM

- 1,250 miles of coated/cathodically protected steel pipe
- Sizes 2" through 30"
- Installed in 1930's through 2013
- 77% in Class 1 and Class 2 Locations
- 23% in Class 3 Locations

AMEREN ILLINOIS MAPPING SYSTEM(S)

- Attribute information currently available in GIS for future NPMS submission
    - Pipe Diameter
    - MAOP
    - Installation Date
    - Wall Thickness
    - Pipe Grade

Pipeline Attribute Table

Field Name	Field Type[1]	Field Length	Short Description	Full Description	Acceptable Values (UPPERCASE)	Required Field[2]
OPER_LINK	I	8	Unique Link ID	Link between the geospatial elements (pipeline segments) and their respective attribute records. Assigned by the operator or the operator's software package (i.e., COVER-ID, MSLINK_ID, etc.). Note the OPER_LINK and the PLINE_ID may be identical. Note that once processing is complete, the OPER_LINK value will be removed from the data by NPMS staff as it will no longer be needed.	Positive integer	Y-if your attributes are not included in your geospatial file; refer to section 3.4 N – if your attributes are included in your geospatial file..
OPID	I	5	Operator Number	Unique tracking number assigned by PHMSA to the company that physically operates the pipeline system. If you do not know your firm's OPID, check with your DOT/Regulatory Compliance department or the NPMS Web site.	Positive integer	Y
OPER_NM	C	40	Operator Name	The company name that physically operates the pipeline system.	Character	Y
SYS_NM	C	40	System Name	Assigned by the operator. The operator's name for a functional grouping of pipelines.	Character	Y
SUBSYS_NM	C	40	Sub System Name	Assigned by the operator. A unique name for a smaller sub-section of a pipeline system. A subset of SYS_NM.	Character	N
PLINE_ID	C	20	Pipeline ID	Assigned by the operator. This is a unique identifier for a specific section of pipeline within a pipeline system.	Character	Y
DIAMETER	D	5	Diameter	Nominal diameter of the pipeline segment, in inches (two decimal places, ##.##).	Real Number	N
COMMODITY	C	3	Commodity Category	Abbreviation for the primary commodity carried by the pipeline system. CRD=crude oil, PRD=non-HVL product, AA=anhydrous	CRD, PRD, AA, LPG, NGL, OHV, CO2, ETH, EPL,	Y

Ameren
ILLINOIS

AMEREN ILLINOIS MAPPING SYSTEM(S)

- Attributes in GIS mapping system
  - Class Location
  - HCA

Ameren Illinois Gas Transmission Mainlines by DOT Class

Class I
Class II
Class III
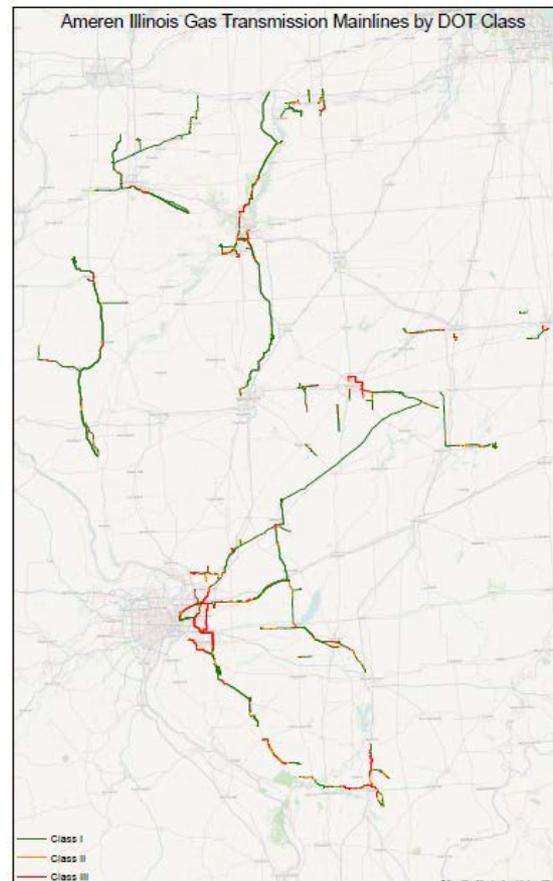
AMEREN ILLINOIS MAPPING SYSTEM

- Level of Accuracy
  - Between 50' to 200'
  - Completed 200 miles of GPS surveys
  - Five year plan to survey remaining transmission pipelines

STEPS UNDERWAY TO UPDATE INFORMATION

- MAOP Record Review and Analysis
- Center Line Surveys
- Conflation

Location of Ameren mains on Bing map

Moving facilities in a GIS to a spatially accurate location

After Conflation

STEPS PROPOSED TO UPDATE GIS INFORMATION

- Additional GIS attributes:
  - Internally Inspectable
  - SMYS
  - HCA
  - PIR
  - Mill Test
  - Risk Area
  - System MAOP Method
  - Attachment of Legacy Record

TIMEFRAME AND RESOURCES

- **Center Line Surveys**
  - Three to five years - $3M

- **Conflation**
  - Two to three years – $2.5M

- **Documentation Management System**
  - Three to five years - $7M

- **Data Integration and Development**
  - Three to five years (Transmission) - $5M
  - Generational (Distribution) - $25M

CHALLENGES IN MEETING PHMSA'S REQUEST

- Approximately 10,000 transmission main segments
    - Twenty plus data points for each segment
    - Verification of over 200,000 data attributes
- Spatial accuracy of current mapping system
    - Relative to Ameren Illinois Land Base
    - Not Google Earth
- Most historical records are paper format
- Electronic records may not be in PHMSA's desired format
- New attributes may not be maintained in GIS system
- Significant time and resources required to complete this request

SUMMARY

- **GIS Origin**
  - Conversion of paper maps with data base component
  - Data inputs from paper sources (i.e. maps & records)

- **Current GIS Land Base**
  - Provides location of facilities in reference to commercial land base
  - Not true with Google Earth

- **Multi-Year Efforts Planned or Underway**
  - Centerline Surveys
  - Conflation
  - Document Management

- **Five Plus Years for Transmission Pipelines**

- **Limited Resources – Competing Projects**
  - MAOP Verification, Review, and Data Integration
  - Integrity Verification Process
  - Replacement of Aging Infrastructure

- **Security of Data**