Upgrading to the Gas Utility Network

A Transmission & Integrity Perspective

INTRODUCTIONS

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SCANA – Transmission System

South Carolina & North Carolina Gas Transmission

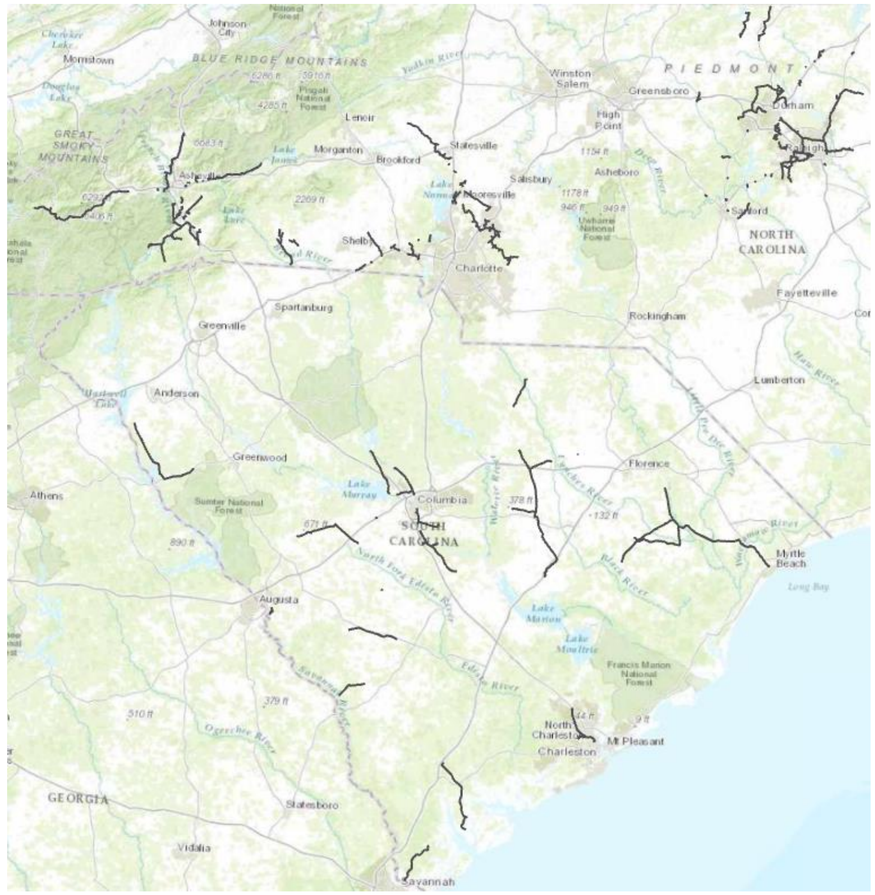
South Carolina Electric and Gas (SCE&G)

Public Service of North Carolina (PSNC)

Total Transmission Mileage ~ 1000 Miles

SCE&G: 453 Miles

PSNC: 545 Miles



SCANA – GIS Environments

SCEG GIS

South Carolina SCANA Gas Transmission

- ArcGIS Pipeline Data Model

South Carolina SCANA Gas Distribution

- ArcGIS Gas Distribution Data Model

Current GIS Environment

- ArcGIS 10.2.1

PSNC GIS

Current GIS Environment

- Smallworld
- Transmission and Distribution data managed within the same SW model/tools

Project Overview - Transmission

Consolidation and Migration of SCEG (APDM) & PSNC (Smallworld) gas assets into Utility Pipeline Data Model (UPDM)

Implementation of ArcGIS Pipeline Referencing Tools

ArcGIS Pro Extension – Centerline Editing

ArcGIS Server Extenstion – Web Event Editing

ArcGIS Desktop Extension – APR Configuration

DNV GL – Synergi Pipeline

- Risk
- MAOP
- HCA/Class
- ILI/Survey Data Tools

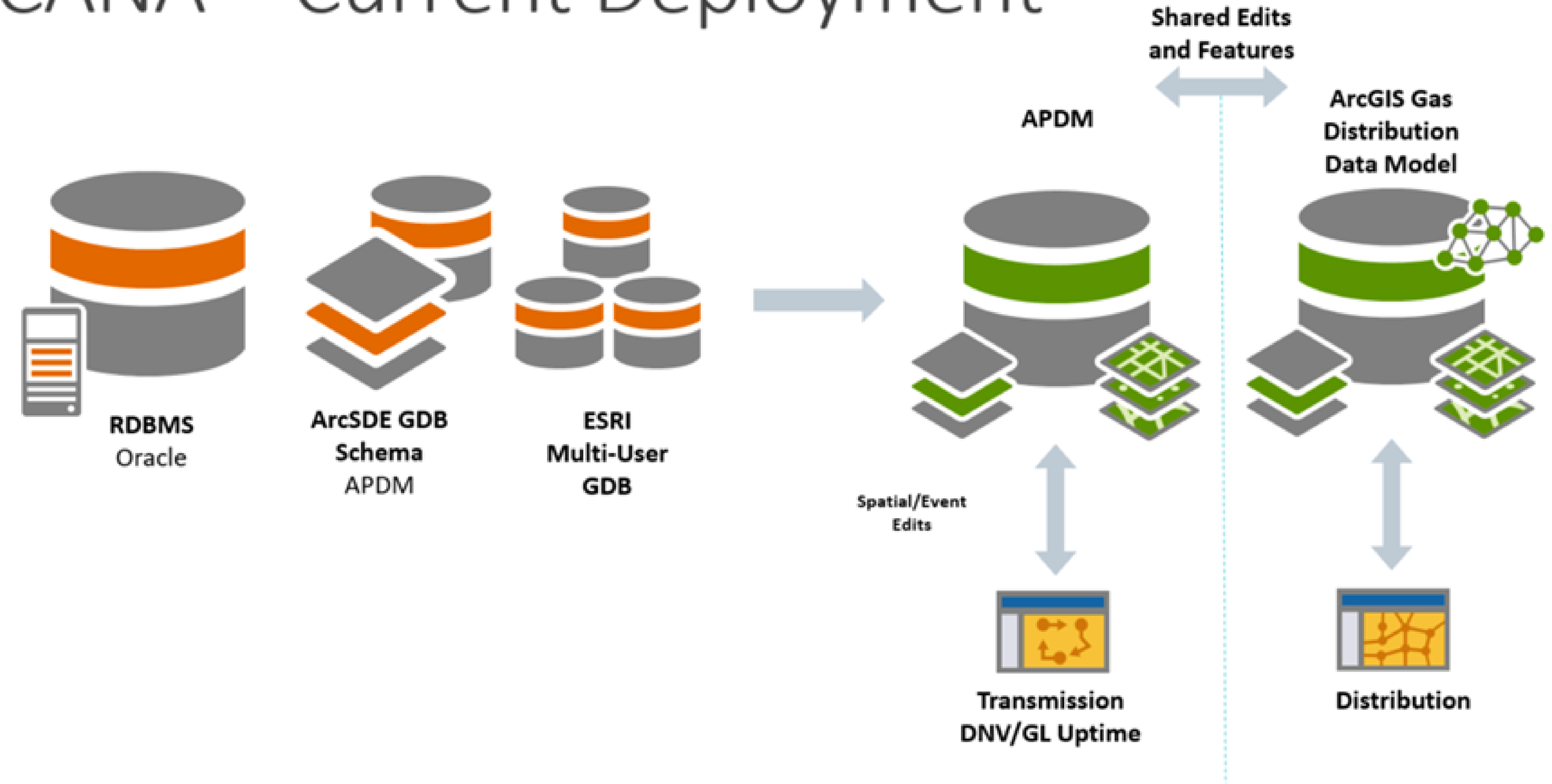
Project Overview - Distribution

Consolidation and Migration of SCEG (ArcGIS Gas Distribution Data Model) & PSNC (Smallworld) gas assets into Utility Pipeline Data Model (UPDM)

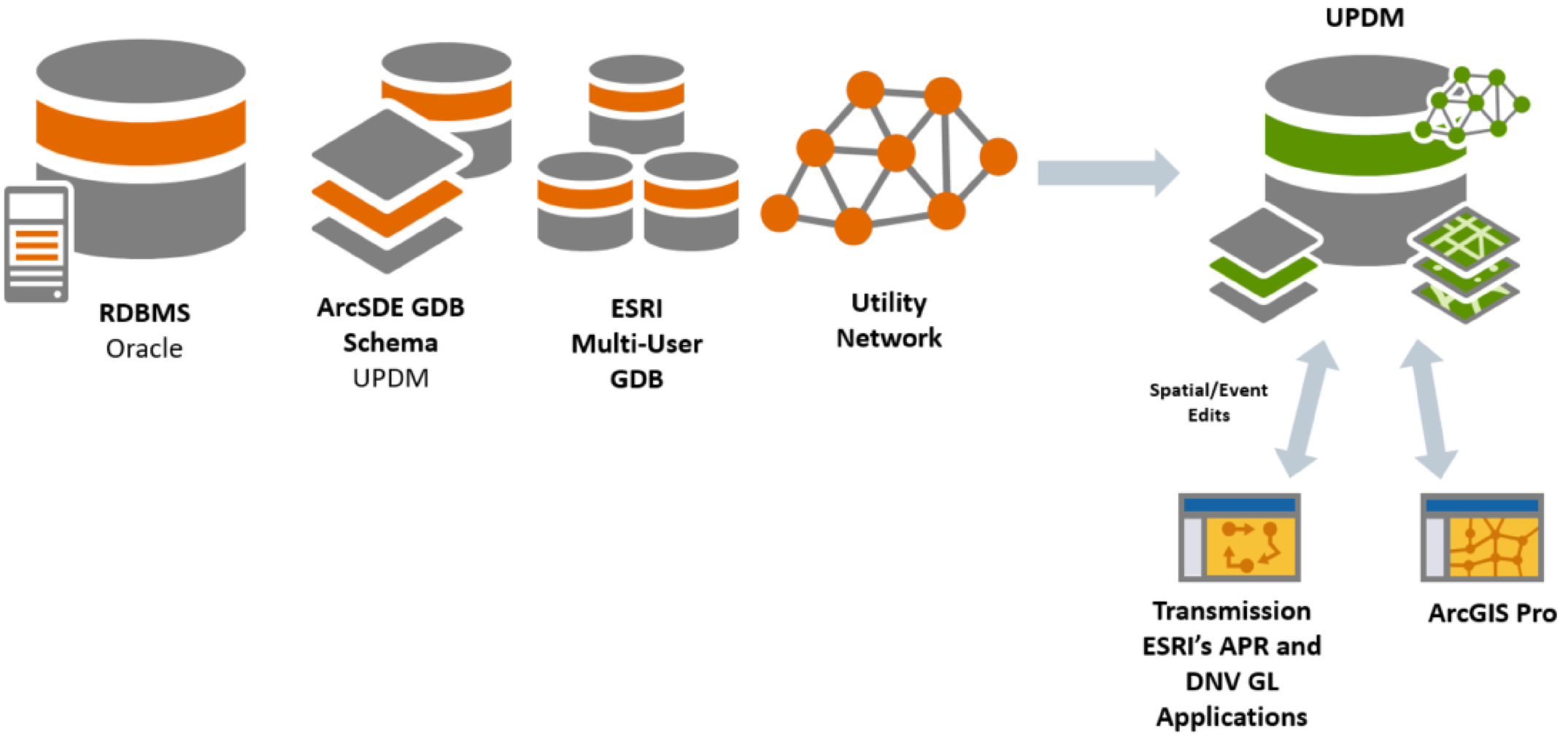
Distribution – Unique Mapping and Migration Project

Focus for todays presentation will be on the Transmission assets/migration

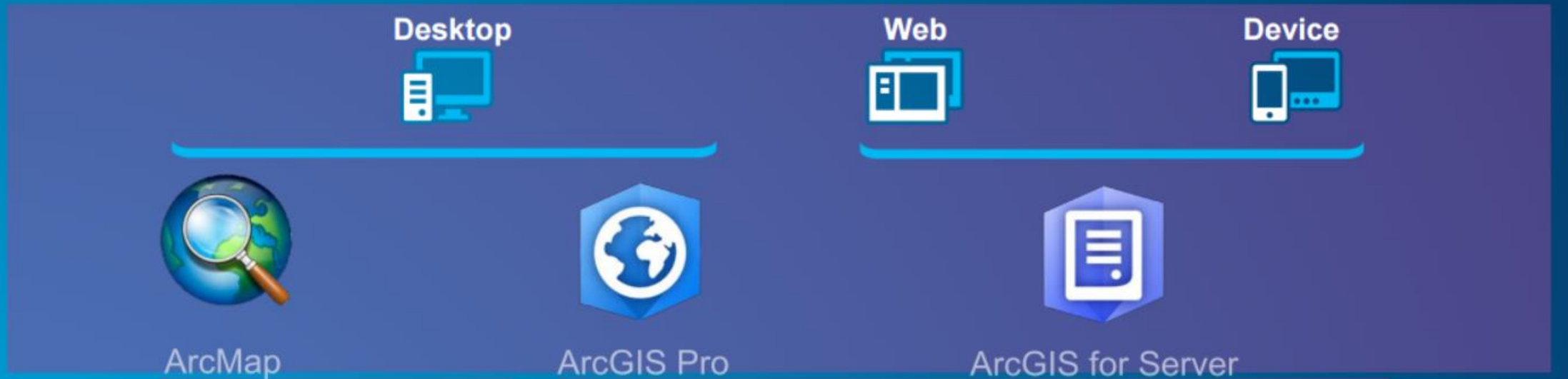
SCANA – Current Deployment



UPDM


RDBMS
Oracle
ArcSDE GDB
Schema
UPDM
ESRI
Multi-User
GDB
Utility
Network
UPDM
Spatial/Event
Edits
Transmission
ESRI's APR and
DNV GL
Applications
ArcGIS Pro

Enterprise capabilities for location referencing & connectivity modeling



Linear Referencing

Geometric Network

APDM – PODS Esri Spatial

ArcGIS Pipeline Referencing

Utility Network

UPDM or “PODS APR”

UTILITY PIPELINE DATA MODEL (UPDM)

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Why UPDM?

- Gas Utility Model
- Industry focused model supported by Esri

- Store and manage external data sets in central repository
  - Currently multiple external databases managing analytical and integrity data
- One system of record

- One location to store historical data
  - Ability to view point in time asset information
  - Ability to view prior years regulatory inputs and data

Why UPDM?

- GIS – Management
  - Single Infrastructure
  - Applications and Integrations
    - Ability to program and configure against one location
    - Streamlined integration points
- Standardized Architecture
- Clarity for the User Community
  - End users/viewers know the go-to GIS location for the entire gas network. Currently, users may need to look 5 or 6 locations

Why UPDM?

- Regulatory Reporting, Asset Views, Mileage, Summaries all coming from one centralized location
  - No need to compare and/or combine data from multiple locations for reporting
- Ability to extend the viewing and consuming capabilities from one centralized database
  - Dashboards
  - Portal
- MAKE OUR GIS A DECISION MAKING TOOL

UTILITY NETWORK (UN)

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Why Utility Network?

- Managing our pressurized network as a whole
- Sub-Network Management
  - Isolation Zones
  - CP
- Technology and Data Access Enhancements
- OOTB Pro Distribution Editing
- OOTB Tracing and Schematics
- ‘Operational View’

LINEAR REFERENCING & APR

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Why Linear Referencing?

- Ability to summarize transmission datasets based on footage/mileage for regulatory reporting:

- HCA, Test Pressure, Class Location
- Event Management – LRS Networks & APR
- Pipe Attribute Summaries: Material, Install Date, Nominal Diameter, SMYS
- ILI and Above Ground Inspections
- CP Protection

Why Linear Referencing?

Risk - Relative Calculations

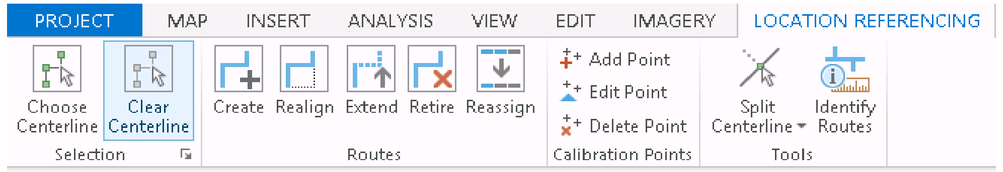
- Dynamic Segmentation across hundreds of datasets
- Reporting
- Risk Ranking

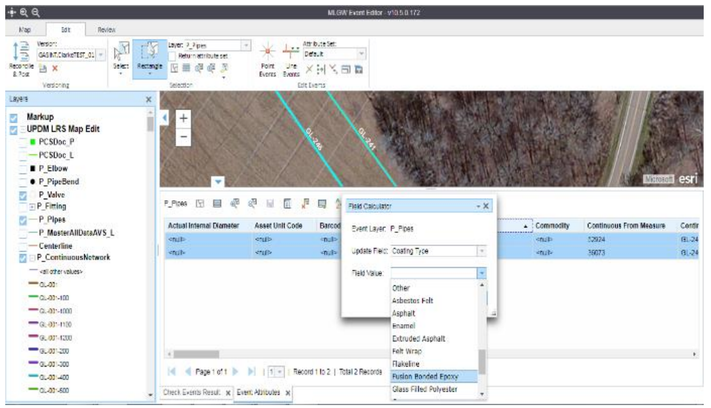
Historical Preservation

- Original Chainage/Location
- Historical Documentation Linking to Known Location
- Field Knowledge

Why Linear Referencing?

- Re-routes, Merge, Splits, In-Line Pipe Replacements
- Management of Downstream Events
- Spatial Pipeline updates
  - Event updates
  - Parent locations
- Integration with asset management systems
- Regulatory analysis that requires linearly referenced lines for processing
  - Class, HCA & MCA
- MAOP Calculations and Data Management





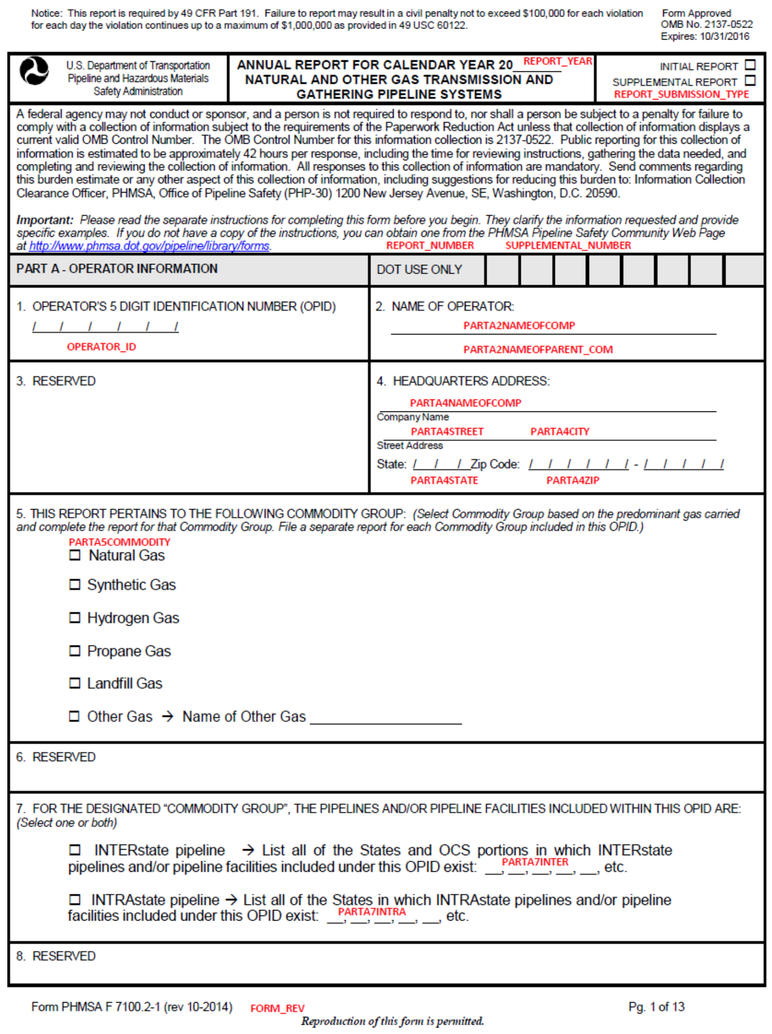
- “From Days to Minutes”

Annual Reports

Summarize PHMSA reporting/mileage

- Product
- Material
- Diameter
- Decade Installed
- SMYS
- Inline Inspections
- Hydrostatic Testing
- HCA/Class
- MAOP
  - Document Verification Mileage Summary
  - (a1), (a2),…Pressure Calculations Mileage Summary

PHMSA Report



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Form Approved
OMB No. 2137-0522
Expires: 10/31/2016

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 20 REPORT_YEAR
NATURAL AND OTHER GAS TRANSMISSION AND GATHERING PIPELINE SYSTEMS

INITIAL REPORT ☐
SUPPLEMENTAL REPORT ☐
REPORT_SUBMISSION_TYPE

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Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline/library/forms.* REPORT_NUMBER SUPPLEMENTAL_NUMBER

PART A - OPERATOR INFORMATION | DOT USE ONLY

1. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER (OPID)
/ / / / / /
OPERATOR_ID

2. NAME OF OPERATOR:
PARTA2NAMEOFCOMP
PARTA2NAMEOFPARENT_COM

3. RESERVED

4. HEADQUARTERS ADDRESS:
PARTA4NAMEOFCOMP
Company Name
PARTA4STREET PARTA4CITY
Street Address
State: / / / Zip Code: / / / / / / - / / / / /
PARTA4STATE PARTA4ZIP

5. THIS REPORT PERTAINS TO THE FOLLOWING COMMODITY GROUP: *(Select Commodity Group based on the predominant gas carried and complete the report for that Commodity Group. File a separate report for each Commodity Group included in this OPID.)*
PARTA5COMMODITY
☐ Natural Gas
☐ Synthetic Gas
☐ Hydrogen Gas
☐ Propane Gas
☐ Landfill Gas
☐ Other Gas → Name of Other Gas _____

6. RESERVED

7. FOR THE DESIGNATED "COMMODITY GROUP", THE PIPELINES AND/OR PIPELINE FACILITIES INCLUDED WITHIN THIS OPID ARE: *(Select one or both)*
☐ INTERstate pipeline → List all of the States and OCS portions in which INTERstate pipelines and/or pipeline facilities included under this OPID exist: PARTA7INTER __, __, __, __, __, etc.
☐ INTRAstate pipeline → List all of the States in which INTRAstate pipelines and/or pipeline facilities included under this OPID exist: PARTA7INTRA __, __, __, __, __, etc.

8. RESERVED

Form PHMSA F 7100.2-1 (rev 10-2014) FORM_REV
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Gas Mega Rule

Part I (expected issuance in March 2019) to address the expansion of risk assessment and MAOP requirements, including:

- 6-month grace period for 7-calendar year reassessment intervals;
- Consideration of seismicity for integrity management assessments (fort both threats and preventative and maintenance measures)
- MAOP exceedance reporting
- Material verification, MAOP reconfirmation (for those with unknown MAOPs or incomplete records)
- Expansion of the risk assessment obligation to include areas in non-high consequence areas (HCAs) and moderate consequence areas (MCAs)
- Related records provisions

Part II (expected issuance in June 2019) to focus on the expansion of integrity management program regulations, including:

- Adjustments to repair criteria for pipelines in HCAs and non-HCAs
- Inspections following extreme weather and other events
- Safety features on in-line inspection launchers and receivers
- Management of change
- Corrosion control
- Other integrity management clarifications and increased assessment requirements

Part III (expected issuance in August 2019) to focus on expanding the regulation of gas gathering lines, including:

- Reporting requirements
- Safety regulations for gas gathering lines in Class I locations
- Definitions

AN EYE ON RISK

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Data – A Risk Perspective

How are pipeline routes being stored in the new model?

- Past models, stored pipelines and systems in StationSeries and LineLoop/LineLoopHierarchy tables.
- UPDM…review existing systems hierarchy and make key decisions for modeling the pipeline LRS networks

SCANA:

- PSNC Smallworld pipeline management versus SCEG Esri (APDM) Data Management
- Unified P_ContinuousNetwork

Data – A Risk Perspective

Data Mapping Phase

Example: APDM.PipeSegment & APDM.Coating -> UPDM.P_Pipes or UPDM18.GasLine

GDO.Main -> UPDM.P_Pipes or UPDM18.GasLine

UPDM Database Extensions

- Where is data duplicated?
- Where can we consolidate?
  - Between both source datasets or within the same
- What fields are truly needed to support GIS asset and integrity management

Phased Data Migrations

- End User Review
- Application Testing

Data – A Risk Perspective

Data Migration

- Team Effort Between Esri Business Partners
- Internal Repeatable Workflows

Data Enablement – ArcGIS Enterprise

LRS Networks & LRS Events

- What participates as a managed event
- Event Responses

Data – A Risk Perspective

Risk Database Extensions

Risk Algorithm – Non Managed Feature Classes

Application Tables and Features Classes – N/A

- Synergi Pipeline utilizes published map/feature services
- Application managed results

SME Features and Risk Inputs

- Managed LRS Feature Classes
- New Editing Workflows
- Benefits:
  - Managed Data Entry
  - Historical Preservations
  - One System of Record

Data – A Risk Perspective

Risk Software Vendor Coordination (DNV-GL)

Early and Often!

Deliver or Provide Access to Iterative UPDM Databases

- Domain Updates = New Risk Score Values!

Risk Results

- Compare your new database, risk algorithm and tool results to historical runs
- Don’t expect a one for one match
  - Data has been updated over time
  - More granular risk calculation
  - Improved Data Inputs

Questions?