Geospatial Data Integration
Between GIS, CAD, & EAM
2011 ESRI Petroleum Users Group (PUG) Conference

April 18-21, 2011
Colonial Pipeline – Business Overview

• Interstate common carrier of refined petroleum products
• Over 5,500 miles of pipeline stretching from Houston to New York harbor
• Headquartered in Alpharetta, GA
• ~680 employees
• Transports approximately 100 million gallons per day:
  • Gasoline
  • Home heating oil
  • Diesel fuel
  • Commercial jet fuel
  • Military fuels
Colonial Pipeline – Systems Overview

ArcSDE, v. 9.2, SP6*
ArcGIS Desktop v. 9.3, SP1*
ArcGIS Server v. 9.3, SP1*
*(Upgrade to v. 10 pending)

Primary Usage:
- Engineering Design for all Pipeline Segments
- Risk Based Analysis
- Regulatory Compliance Initiatives

AutoCAD MAP 3D v.2011
Autodesk Inventor v.2011

Primary Usage:
- Engineering Design Data for all Facilities
- Regulatory Compliance Initiatives

WebSphere Application Server 6.0
MAXIMO Application Server 6.2.6

Primary Usage:
- Asset Management, Maintenance Planning,
  Inventory Control,
  Regulatory Compliance Tracking

G-Forms v. 4.0.1.4

Primary Usage:
- Electronic Data Submission

Adept v.8.2.4

Primary Usage:
- Engineering Document Control
Colonial Pipeline – Current Projects

Data Integration Utilizing:

1. Geo-Referenced, High Resolution Photography (3cm Accuracy)
2. Geo-Referenced, CAD Piping Layouts (XREF’ed to all pertinent facility drawings)
3. Overlaid onto GIS Data and Assessed for Accuracy
Colonial Pipeline – Current Challenges

Data Ownership & Integration
Integration is a Collaborative Effort
The Path Forward

User Groups

Standards development for GIS/EAM/CAD data exchange

Data management model enhancements (APDM & PODS)

Collaboration w/ Qualified Consultants …
One of the World’s largest privately-held spatial consultancies

Spatial consulting, systems integration, software development and managed services

Ranked First in the “IT Managed Services in Mid-Tier Market for Engineering Industry”

SNAPSHOT
Divested from CH2M HILL 64-year, $6.3 billion engineering company
Full-service IT solutions provider
60+ offices worldwide
700+ professionals
GIS/EAM INTEGRATION – WHY?

- Where are your assets?
- How redundant is your data?
- Can you recognize patterns?
- Is your planning and dispatch optimized?
GIS/EAM INTEGRATION – PLANNING?

- Current Systems
- Existing Data Structure
- Future Data Structure
- Staff Capabilities
- Transaction Types
- Future Integrations
- Mobile
GIS/EAM INTEGRATION – HOW?

- COTS (Commercial Off The Shelf) Solutions
- Custom Solutions
- Hybrid Solutions
GIS/EAM INTEGRATION – CHALLENGES?

- Business Case Development
- Scope Definition
- Interdepartmental Coordination
- Data Quality
- Defining System of Record
- Data Stewardship
GIS/EAM INTEGRATION – EXAMPLE 1

GIS Solution
- Create New Service Request
- Identify Assets
- Job Plan and Estimate

AM Solution
- Schedule Work, Assign Crews and Equipment
- Track Progress, Financial Monitoring

ArcGIS Server

IBM Maximo

User Roles
Standard GIS Tools
User Tools
Function Dialog
Tabular Dialog
Technology-based Approaches:

+ Leverage existing GIS technology to spatially locate Maximo Service Requests and Assets
+ Services Oriented Architecture (SOA) design
+ Utilizes ArcGIS Server 9.3.1 and Maximo V7+
+ Integration through web services
+ Real-time data synchronization between systems
+ Configurable end user experience driven by work flow, performance, and simplicity
GIS/EAM INTEGRATION – AN EXAMPLE