GPS, Centerline and APDM

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NiSource (NGT&S) and GE had just concluded a project of migrating all 17,000 miles of the NGT&S data from a FRAMME based system to an ArcSDE Enterprise GIS.
FUNCTIONAL REQUIREMENTS

The system is designed to be an Enterprise GIS

- Repository for all pipeline facility data
- Full Life Cycle application
  - Business Analysis
  - Operations
  - Pipeline Integrity
- Distributed technology for geographically dispersed audience
ACTIVITIES

• Pipeline data maintenance and mapping
• Web Applications – GIS Web Portal
• Feasibility, planning, operations
• Pipeline Risk Analysis
• HCA, Class and MAOP calculations
• Special Mapping
• Facilities Planning
• Project Planning
• Keys to making the GIS a true Enterprise solution
MAINTENANCE PLATFORM

- ArcGIS (ArcSDE, ArcIMS, ArcServer)
- Oracle 9.x
- APDM data model
- PipeView for ArcGIS(PVAG)
- Production Tools
  - ASG
  - Arc PLTS, Arc Schematics, GPT
  - Report Generator
APDM Data Model Design

APDM is based on the concept of Linear Referencing

- The centerline is a M-Aware polyline
- The features are linear and point events.
- Topology rules in effect
NGT&S Challenges

- Discovery of pipeline location issues
- The need to reconcile pipeline location
- 17,000 miles of pipe
- What constitutes “correct” location? (Integrity driven)
- Needed GPS points
- Needed to complete quickly
SOLUTION

- Columbia contracted Photo Science to GPS whole system.
- Data returned and centerline adjusted
Examples
NGT&S next challenge

• Utilized PVAG to maintain data in the APDM rather than utilizing core ArcGIS functionality
• Topology rules were in effect.
• Edits were painfully slow. (unexpected)
• Routine work had to continue
• Time and resources
NGT&S Conclusion

• Hire a larger staff and stop all other work (NOT!)
• Needed to solve that problem NOW!
SOLUTION

- Columbia approached GE with the problem
- GE proposed a solution
  - a leaner data model utilizing:
    - Event tables, (from features based to events based)
    - Core ArcGIS functionality
    - Customized light weight toolbar stack
RESULTS

• Higher productivity rate
• Data integrity maintained
• Toolbar helped to drive placement of new events where needed, and ArcGIS managed the rest.
• Quick turnaround of project
SUMMARY

- NGT&S put 20 users on the project - completed it in 2 months rather than years
- Met the deadline
- GE had the GIS up and running on APDM/PVAG production system within a week of the completion of the edits.
- Credibility maintained by delivery
- Improved data
LESSONS LEARNED

• GIS applications can have many purposes and uses
• Designs that work well for their initial need may fall short when pressed into service for other purposes.
• This was a good training opportunity for practical experience in a production environment.
• Ask the questions
BENEFITS

- NGT&S and GE were able to leverage talents
- Faster turnaround, credibility maintained
- Because data integrity was enforced, GE was able to manipulate the database design easily for smoother transitions and apply knowledge in future products and enhancements
- NGT&S was able to control cost and schedule
- Better data for calculations and analysis
Questions ?