WindMil Map ESRI
Combining Engineering Analysis with GIS

Doug Lambert

## SCADA and Engineering Data Supervisor

Overview

- The idea of keeping our engineering analysis model, GIS data, and our outage management model all synchronized is a daunting task that takes many hours of checking and correcting differences. The GIS analyst edits in three applications, at the same time, in order to keep all of the required information up to date. What if we could touch the data once in one application and it would update or share that information automatically behind the scenes to the other applications?   Milsoft Utility Solutions is writing such a solution now. San Bernard Electric Cooperative (SBEC) is the alpha site on this project. I will show the history of how our GIS developed to this point. Then I will explain where we see it going in the very near future. I will then show some of the cost savings SBEC will benefit from utilizing this solution.

SBEC Company Statistics

- Organized in 1939
- About 23,000 Meters
- Cover Portions of 7 Counties
- Average growth of 900-1200 meters annually.
- www.sbec.org
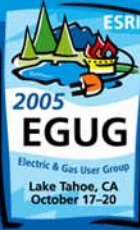- Not "opted in" to the deregulated market.
- Four offices

Service Area and Board District Map
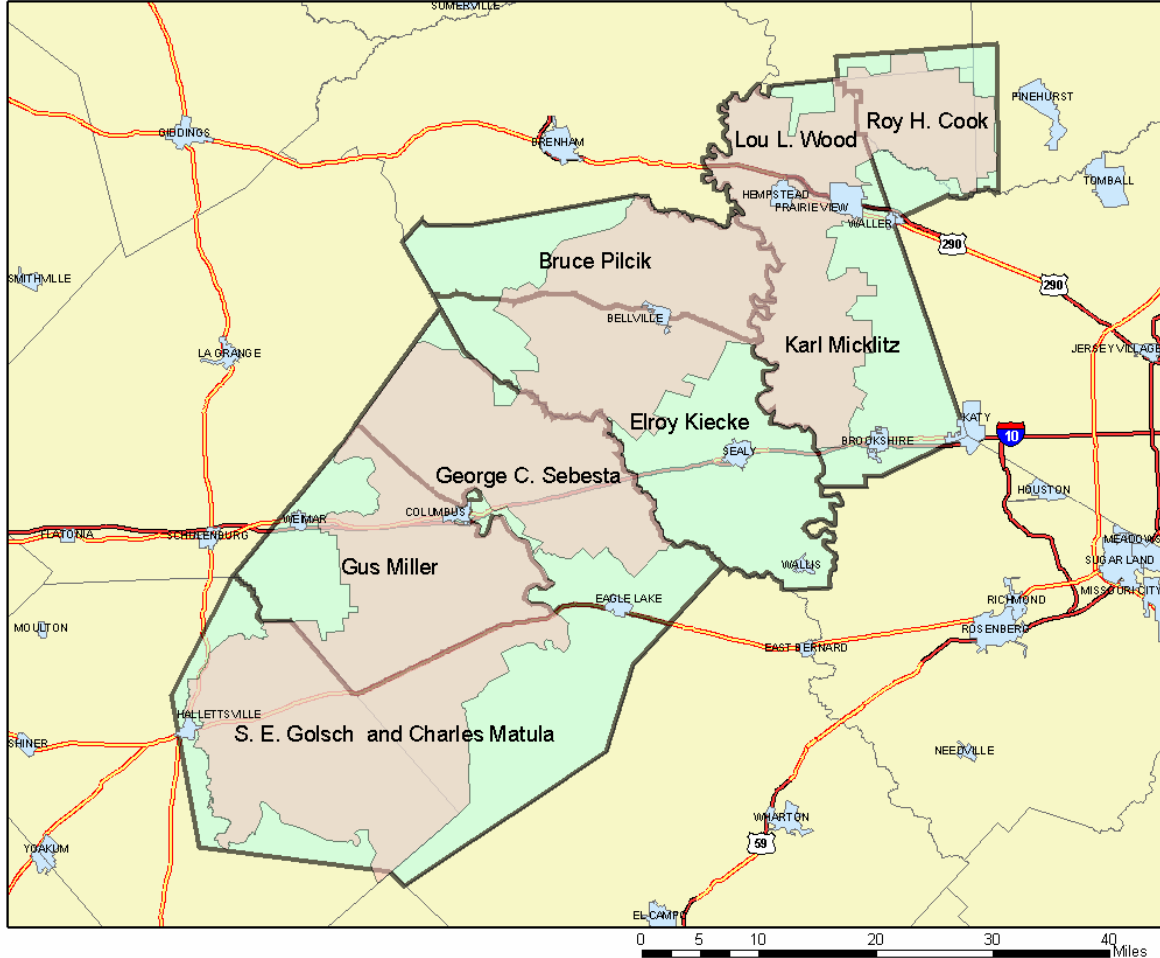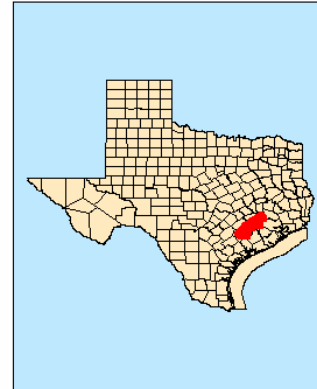
SBEC GIS Evolution

- Mylar with ink
- AutoCAD drawings
- GenMap 'GIS' in AutoDesk
- CADP's AutoCAD Map GIS
- NISC's with ESRI ArcMap GIS

SBEC Engineering Analysis Evolution

- DOS Milsoft – one line mainly used for voltage drop and motor starts. No geographic location and little detail.

- Milsoft's WindMil – more detail with line-sections in a Windows application. No meter level detail. No segments. More geographically correct. (Data shared from maps, but limited with batches).

- Later Versions of Windmil – added segments and more detail with background info. (Need for GIS data integration increased).
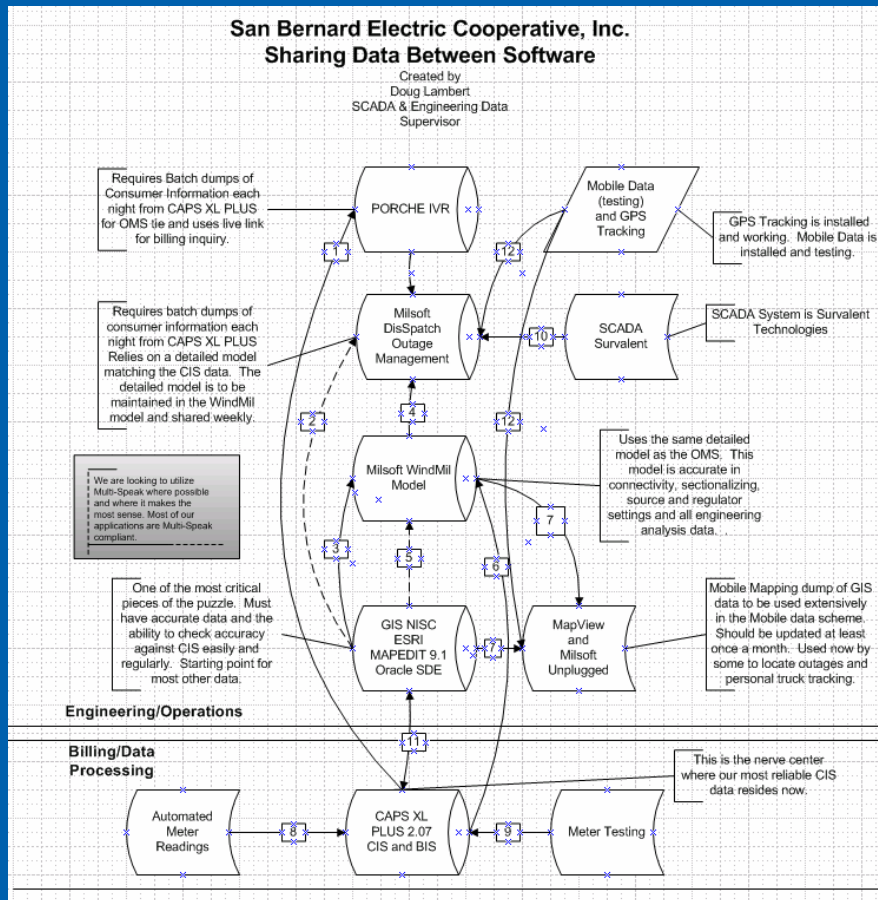
SBEC Engineering Analysis Evolution Cont.
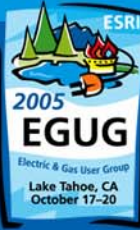
- Introduction of the Outage Management System - used same model as the Engineering Analysis Model

- Engineering Analysis Model – accurate to the meter level and geographically correct with background (each pole is GPS inventoried).

- The Engineering Analysis Model and the GIS must stay synchronized for the Outage Management to work as designed.

SBEC – Introduction of additional applications

- Map viewing applications
- Automatic Vehicle Location
- AMR
- SCADA (Supervisory Control and Data Acquistion)
- IVR (Interactive Voice Response)
- Staking Sheet Application
- Laptops and mobile data
- Integration of applications continues to improve

SBEC Data Sharing and Applications Today

San Bernard Electric Cooperative, Inc.
Sharing Data Between Software

Created by
Doug Lambert
SCADA & Engineering Data
Supervisor

Requires Batch dumps of Consumer Information each night from CAPS XL PLUS for OMS tie and uses live link for billing inquiry.

PORCHE IVR

Mobile Data (testing) and GPS Tracking

GPS Tracking is installed and working. Mobile Data is installed and testing.

Requires batch dumps of consumer information each night from CAPS XL PLUS Relies on a detailed model matching the CIS data. The detailed model is to be maintained in the WindMil model and shared weekly.

Milsoft DisSpatch Outage Management

SCADA Survalent

SCADA System is Survalent Technologies

We are looking to utilize Multi-Speak where possible and where it makes the most sense. Most of our applications are Multi-Speak compliant.

Milsoft WindMil Model

Uses the same detailed model as the OMS. This model is accurate in connectivity, sectionalizing, source and regulator settings and all engineering analysis data.

One of the most critical pieces of the puzzle. Must have accurate data and the ability to check accuracy against CIS easily and regularly. Starting point for most other data.

GIS NISC ESRI MAPEDIT 9.1 Oracle SDE

MapView and Milsoft Unplugged

Mobile Mapping dump of GIS data to be used extensively in the Mobile data scheme. Should be updated at least once a month. Used now by some to locate outages and personal truck tracking.

Engineering/Operations

Billing/Data Processing

Automated Meter Readings

CAPS XL PLUS 2.07 CIS and BIS

Meter Testing

This is the nerve center where our most reliable CIS data resides now.

1. We are using a batch dump of the CIS database which is performed manually on a regular schedule.

2, 5. Because our GIS system isn't completely connected properly according to ESRI business rules, we have been maintaining two databases one for WindMil and OMS and one in GIS. We are working towards this becoming one database with Milsoft's help developing the WindMilMap ESRI Module and we are fixing our connectivity issues in the GIS as well.

3. This is the same detailed model that is exported from the GIS for the OMS.

4. The only issue here is to make sure that the latest and most correct WindMil model is available to the OMS. This works well because both software use the same data.

6. Routines are now in place and being utilized to dump our billing load into our WindMil model.

7. This process works well. This only takes about 30 seconds to synchronize the Unplugged to the server data. It takes about 6 hours to do the same to MapView.

8. This works well other than a few speed issues.

9. NISC is supposed to have a process in place for automatically dumping the meter testing data from an ascii file in the next release version 2.06. This will still require an export by the meter tester.

10. New SCADA is in place It will be Multi-Speak R.2 compliant which allows for data exchange to the OMS. However, the operation of SCADA should and will still reside in SCADA.

11. We need to do a lot of work in this area. We want to fine tune this and place heavy emphasis on maintaining this in the future. We need reliable information and we need routines that tell us what we need to fix.

12. Reports to a common SQL- Server Database and updates at regular intervals. Working for MapView. Testing now for DisSpatch.

Internal Issues Encountered
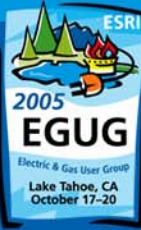
- As applications developed, the duties on the GIS analysts increased. More information needed with accuracy and speed.

- Duplicate data is entered into multiple applications by people with no accountability to the results of errors.

- An increasing demand that all application data is current and free of conflicts.

- Engineers need control of engineering data.

- Politics of different departments (data processing, engineering, billing, operations)

Streamlining the process

- WindMil Map ESRI – combines GIS, Engineering Analysis, and Outage Management data edits and entry into one application – ESRI ArcMap.

Advantages of WindMil Map ESRI

- Engineer controls engineering data through WindMil.
- Changes in WindMil are seen in GIS and changes in GIS are seen in WindMil Model.
- Breaking down departmental walls
- No delays in getting the latest info
- No duplication of work and data
- Accountability for information entered
- Labor, time, and $ savings
- Improved accuracy

Advantages of WindMil Map ESRI

- 'The Best of Both Worlds' - All the functionality of ESRI and WindMil Engineering Analysis combined into one.
- Better 'on the fly' published maps for construction work plans and 'what-if' scenarios.

SBEC Data Sharing and Applications with WindMil Map ESRI

San Bernard Electric Cooperative, Inc.
Sharing Data Between Software

Created by
Doug Lambert
SCADA & Engineering Data
Supervisor

We are using a batch dump of the CIS database which is performed manually on a regular schedule.

This process works well. This only takes about 30 seconds to synchronize the Unplugged to the server data. It takes about 6 hours to do the same to MapView.

This works well other than a few speed issues.

NISC is supposed to have a process in place for automatically dumping the meter testing data from an ascii file in the next release version 2.06. This will still require an export by the meter tester.

New SCADA is in place. It will be Multi-Speak R.2 compliant which allows for data exchange to the OMS. However, the operation of SCADA should and will still reside in SCADA.

WindMil Map ESRI, NISC MapEdit 9.1, and ESRI ArcMap 9.1 All working together in the same application saving all edits to the appropriate databases without additional input or batch processes.

Reports to a common SQL- Server Database and updates at regular intervals. Working for MapView. Testing now for DisSpatch.

ESRI 2005
Electric & Gas User Group
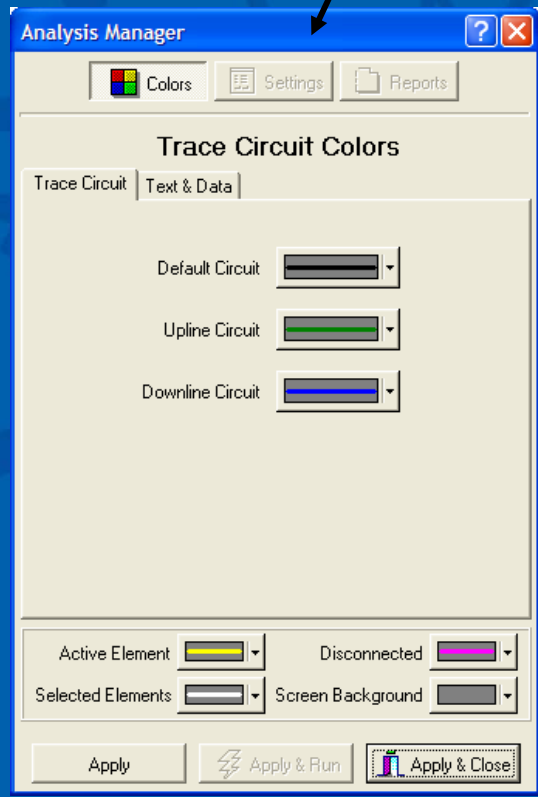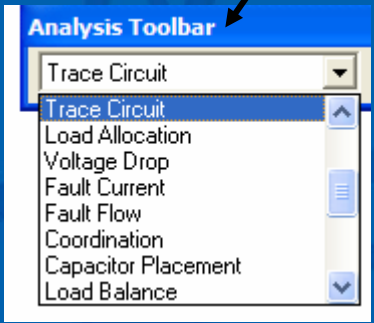
WindMil Map ESRI Screen Shots

Overhead Line in Trace Mode

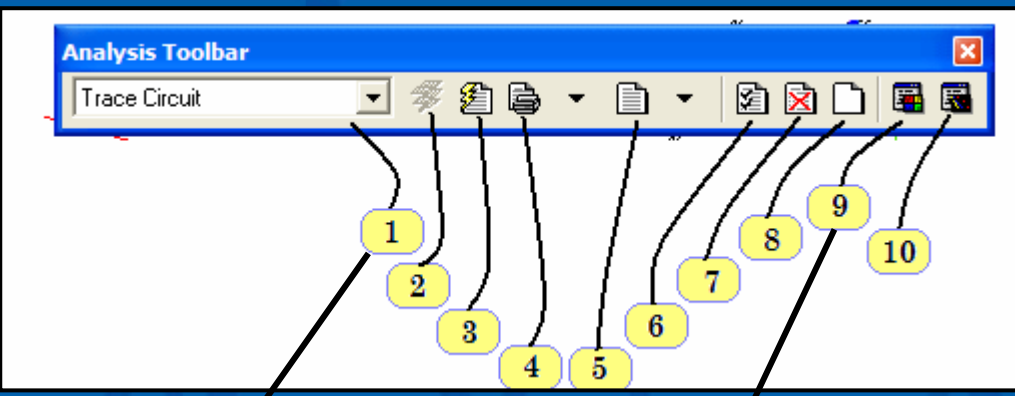# Equipment Editor

WindMilMap ESRI Toolbar Functions

1. Edit WindMap Development Settings

2. Enable WindMil Edit Mode

3. Add New Element

4. Disconnect Element

5. Connect Element

6. Delete Element

7. Change Feed Element

8. Back Feed Element

9. Move Element

10. Open

11. Close
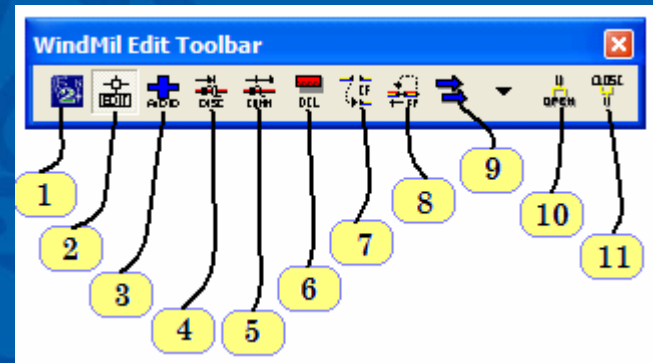
1. Analysis Mode Picker

2. Recalculate Analysis

3. Display reports automatically

4. Print current report

5. Display current report

6. Display warnings

7. Display Errors

8. Purge warnings and errors

9. Analysis Manager

10. Light Table coordination

Circuit Toolbar

1. Enable WindMil Edit Mode

2. Add Source

3. Add Overhead

4. Add Underground

5. Add Regulator

6. Add Transformer

7. Add Switch

8. Add Capacitor

9. Add Device

10. Add Node

11. Add Generator

12. Add Motor

13. Add Consumer

14. Toggle Continuous Mode
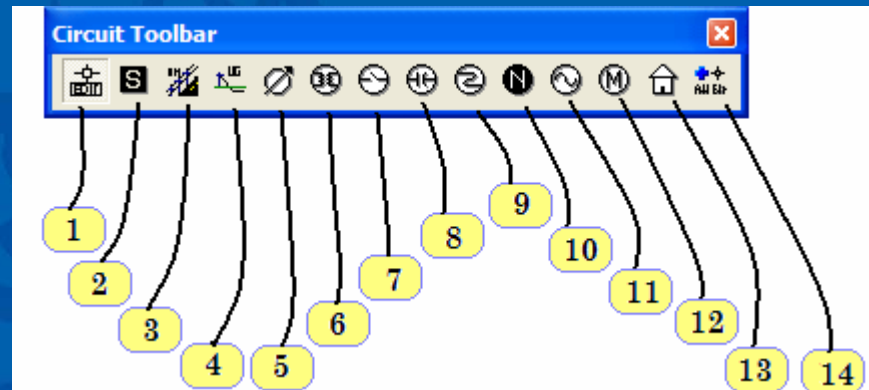
Show Toolbars in WindMil

- WindMil Toolbars

Planned Implementation

- 1st Alpha installed at SBEC
- 5 more Alpha sites have been added.
- Moving to Beta testing in January 2006.
- Ready for market June 2006

Future Expectations

- Add Staking sheet API.
- Continue to look at the duplication of data entry and processes and combine them into one intelligent location while sharing the appropriate information to the appropriate applications and/or departments with as much automation as possible.

Costs Savings
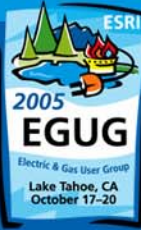
- WindMil Map ESRI is a labor savings tool. This allows those human resources that were tied up in data entry to be better utilized in other areas.

- The data integrity is improved; thereby, eliminating 'running down problems'.

- Customer service is improved by providing up to date and accurate information to the Outage Management System.

Questions

- www.milsoft.com   (325) 695-1642

San Bernard
Electric
Cooperative, Inc.

- www.sbec.org - Doug Lambert

     dlambert@sbec.org