A GIS Emerges from Flood Ravaged Piping

Benjamin Taylor
Entergy Gas Operations
New Orleans
• History of our new GIS
• Gas infrastructure rebuild project
• Improving gas reliability
Starting a GIS

2004 Gas GIS funding approved
2005 Purchased GE SmallWorld Software
2005 Designed architecture
2005 Started conversion of Gas Distribution Mains
Sample cards from old mapping system
Complex intersections like Canal and Basin
Now in GIS
then Hurricane Katrina happened
Flood Waters: What Happened?

flood water pressure = 48” water column

gas pipe pressure \( \frac{1}{4} \) psig = 7” water column
Flood waters entered our piping in many ways. For example, wherever a house shifted, gas bubbled out, water pushed in.
Flood waters receded, but water was still trapped in main and services
Siphons can be attached to the underground gas mains
So we began siphon pumping to remove the water
MAKING SIPHON MAPS for WATER REMOVAL
• Digitized low pressure mains and siphons
• Made GIS maps for field crews
• Maps indicate slope of main to find low points (for temporary siphons)
Crew using GIS siphon map
RECORDING WATER REMOVAL and GAS RESTORATION PROGRESS in GIS
As gas became available we drew a new boundary.
INFORMATION for the CALL CENTERS
When can my gas meter be turned back on?

- Geocoding customers from CCS
- Computer code for gas availability
Projected gas availability dates

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>UP</td>
<td></td>
<td>Unavailable UP/RIP gas - UP Gas available by the end of April</td>
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<tr>
<td>Hollygrove 5</td>
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<tr>
<td>Mid City 9</td>
<td></td>
<td>area complete</td>
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<tr>
<td>The Bow 9</td>
<td></td>
<td>area complete</td>
</tr>
<tr>
<td>Ferrelleusa 9A</td>
<td></td>
<td>area complete</td>
</tr>
<tr>
<td>ST Claude 11</td>
<td>April</td>
<td>Unavailable UP/RIP gas - UP Gas available in mid April</td>
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<tr>
<td>ST Roch 6</td>
<td></td>
<td>area complete</td>
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<tr>
<td>Lower Ninth Ward 12</td>
<td>April</td>
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Colbert
Electric outage system SAISO

gas available

projected restoration date
After Restoration, we continued to complete our GIS project...
• Services - connected customers to gas network
• Valves
• Regulator Stations
• Cathodic Protection
• Other Gas Facilities
REBUILD PROJECT
Near the end of 2006, we began our Rebuild Project to replace the damaged pipe.
We began designing and installing new pipe.
So we decided to draw “Proposed Main” in system

- Gas Planners
- Pipe Locators (call before you dig)
- Reliability Investigators
Proposed “orange” main (with attributes)
A current city view of proposed main (design complete)
A Live Connection to our Customer Information System
Designers need access to the Customer Information Data. But the CCS is not spatial.
So we connected the GIS to the CCS via each customer’s PremiseID

- Count active customers in a rebuild area
- Count number of meters by type needed for ordering
OUR REBUILD PROGRESS:

Since Fall of 2006 we have installed new main (green) and have designed new main (orange). 60 block miles

March 2006

March 2008
RELIABILITY
The GIS is also used to help improve the reliability of an area until the pipe replacement is complete.
WATER REMOVAL
(SIPHON PUMPING)
Siphons are continually pumped to remove water.
## Reports

### Siphon Details Report

<table>
<thead>
<tr>
<th>Siphon Temp</th>
<th>Street</th>
<th>Date</th>
<th>Volume</th>
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<tbody>
<tr>
<td>Claiborne &amp; St Andrew</td>
<td>20400</td>
<td>04/11/2006</td>
<td>21640</td>
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<tr>
<td>Felicity &amp; Claiborne</td>
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<tr>
<td>Josephine &amp; Willow</td>
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<td>1470</td>
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<td>Claiborne &amp; Josephine</td>
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<td>10/13/2005</td>
<td>1155</td>
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<tr>
<td>Claiborne &amp; Philip</td>
<td>2340</td>
<td>10/13/2005</td>
<td>2340</td>
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</tbody>
</table>

### Siphon Totals Report

<table>
<thead>
<tr>
<th>Street</th>
<th>Volume</th>
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</thead>
<tbody>
<tr>
<td>St Andrew</td>
<td>81251 Gals</td>
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</table>

Siphon Totals Report
Run at 08:35 AM

Siphon Totals Report
Run at 16:30 2006
Siphon Analysis

- water removal progress
- siphon pumping efficiency
Engineers can overlay siphons with geo-coded customer outages.

- generate new routes
- determine siphon pumping frequencies
OUTAGE
MITIGATION
The GIS can be used to reduce outage effects on customers and help get the gas back on.
Leaks and Outages

• Valves - system isolation
• Active customers: shutoff or relight
OUR FUTURE

- GIS Connection to Document Management System
- Graphical Design Interface
Reliable gas service