

MODERNIZING SURVEY123 DATA MANAGEMENT

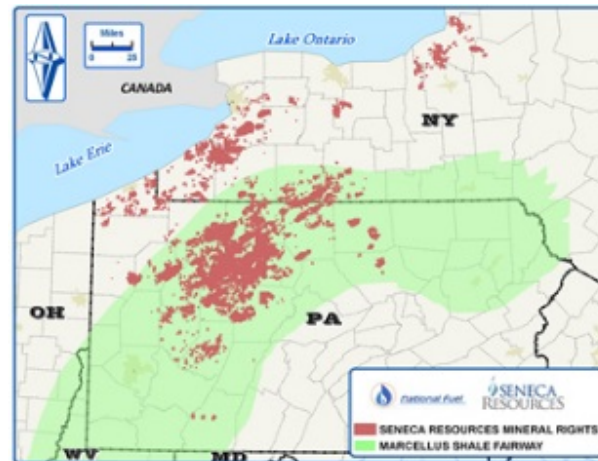
Gary H. Bowles
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About Seneca Resources Company

- Seneca Resources Corporation (Seneca), the exploration and production segment of National Fuel Gas Company, headquartered in Houston, Texas, explores for, develops and produces natural gas and oil reserves in California and the Appalachian Region including the Marcellus and Utica Shales.



Special Achievement in GIS
2014 Award Winner

Agenda

- Survey123 & Seneca
- Initial Data Management
- Data Management Modernization
- Case Study – MIA Inspections

Once upon a time...

- The primary means of field data collection was the paper form.
 - Daily, Weekly, Monthly, Quarterly, Annual Inspections
 - Regular Maintenance
 - Environmental
 - Regulatory Compliance



Well Pad Monthly Inspection Report

must be performed and using the lower below place on. It is relevant to that above ground structure. For MW's must add a "Y" to be checked, a comment MUST be noted as to what the issue(s) are. Should more space be required use the remaining section at the bottom of the page or create sheets of paper.

PAD Church Run L13-N

GENERAL	YES	NO	COMMENTS
Significant leaks present			
Containment(s) are damaged or leaking			
Chemical injection containment deteriorated			
Automation control boxes opened & not locked			
Any bleed points not secured with a plug or blind flange			
PRODUCTION STORAGE TANKS			
Production Storage Tanks/size of liquid leakage	<input checked="" type="checkbox"/>		
Production Storage Tanks are damaged, rusted or deteriorated			
Manway bells are damaged (Cat Walk)			
Truck Loading/Unloading Facility is damaged			
Fluid inlet valve at storage tank & valve on header closed (Should be locked open)			
Manual drain valve on each storage tank open (Should be closed & plugged)			
Valve on storage tank not locked and open (Should be closed & locked)			
GPUs / HEATERS			
GPU(s)/Heater is being cyclic or deteriorated (Note the well number that applies)			
GPU Flashed (If yes, list well # in comments)			
Flame is not burning correctly inside fire tube			
Any in-line valves for PRV not locked open			
In-Line Heater fuel controls exposed (Should have cover)			
Blowdown & heater bypass valves left open (Should be closed & locked)			
Cabinets/Sheets are secure (Should be locked)			
PIPING			
Buried pipelines are exposed			
Pipe Rack and piping is deteriorated			
Corrosion evident on production facility piping			
WELLHEADS			
Wellhead/size of corrosion (Note the well number that applies)			
Collar gate/size of corrosion			
Collar has debris or any obstructions			
Collar secure, unsafe, or not properly gated			
Well not properly marked with identification tag on wellhead (Note well # if missing)			
ESD handwheel is secured by wellhead(s)			

NOTE: Well S/I Requirement: If the well has been shut in for more than 24 hours ensure the primary feed valves including the interior casing wing valves, and the lower master valve are secured with a cable and lock.

REMARKS:

Signature: _____ Date: _____



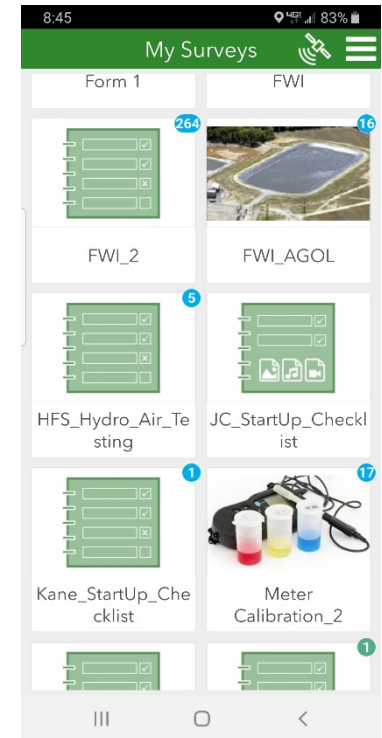
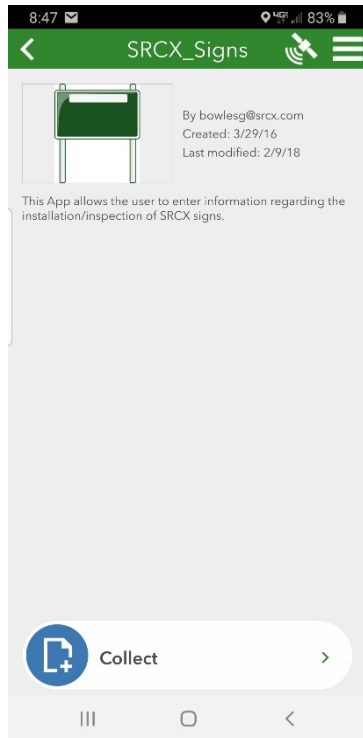
And then one day...

- In September 2015, the Geomatics team decided that we could collect field data more efficiently using Survey123 for ArcGIS.



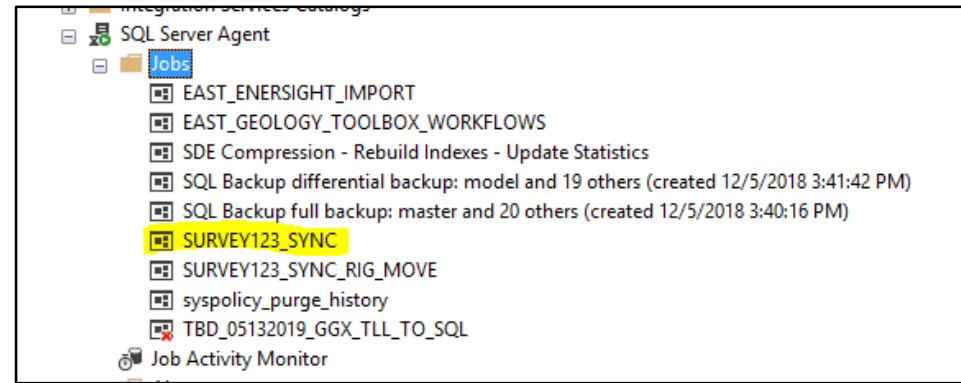
And Now We Have

- Over 31 forms being used daily
- 16 iPad minis and 2 Samsung Galaxy Tab E in the field being used by contractors
- Developing more surveys across multiple departments



Data Management

- Copy to SDE database
- Create view in SQL Server



```

*export.py - C:\export.py (2.7.10)*
File Edit Format Run Options Window Help
# -*- coding: utf-8 -*-
#
# -----
# export.py
# Created on: 2016-07-12
# Description: python script to export from BDS to SQL
# -----
# Import arcpy module
import arcpy

# Local variables:
fbs = r"C:\Users\boylej\AppData\Roaming\ESRI\Desktop10.4\ArcCatalog\BDS.sde\db_da458.hsu_0sv1f.hostedservice_f_b9df3325224040a034b82d7c38_fluid_by_stage_v
fbsApps = r"C:\Users\boylej\AppData\Roaming\ESRI\Desktop10.4\ArcCatalog\Apps.sde\Apps.DBO.Fluid_by_Stages"

arcpy.env.maintainSpatialIndex = True

# Process: Delete Features
arcpy.DeleteFeatures_management(fbsApps)

# Process: Append
arcpy.Append_management(fbs, fbsApps, "NO_TEST")
|

```

Data Management

- Display in Excel spreadsheet

Survey123_MonthlyPlunger_2018 - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DESIGN

Clipboard Font Alignment Number Styles

Normal Bad Good Neutral Calculation Check Cell

FILENUM	Area	Prospect	Pad Name	Well Name	Well Tender	Other - Well Tender	Inspection Date	Manufacturer	# Trips Since Last Inspection	Plunger Type
50026	EDA	DCNR 595	D	DCNR 595 5H	ScottThomas		2018-03-08	Priority	170	DoublePad
50028	EDA	DCNR 595	D	DCNR 595 7H	ScottThomas		2018-03-08	Priority	262	DoublePad
50024	EDA	DCNR 595	D	DCNR 595 3H	ScottThomas		2018-03-08	Priority	340	DoublePad
50370	EDA	DCNR 595	D	DCNR 595 53H-S	ScottThomas		2018-03-08	PCS	374	TurnedDownBarStock
50232	EDA	COVINGTON	F	DETWEILER 7H	ScottThomas		2018-03-08	PCS	612	SinglePad
50325	EDA	COVINGTON	C	VALLDES 5H	ScottThomas		2018-03-08	Priority	621	TurnedDownBarStock
50327	EDA	COVINGTON	C	VALLDES 7H	ScottThomas		2018-03-08	Priority	667	TurnedDownBarStock
50328	EDA	COVINGTON	C	VALLDES 8H	ScottThomas		2018-03-08	Epic	1088	TurnedDownBarStock
50023	EDA	DCNR 595	D	DCNR 595 2H	ScottThomas		2018-03-08	Priority	45	TurnedDownBarStock
50196	EDA	COVINGTON	A	MURRAY 1H	ScottThomas		2018-03-08	Priority	45	TurnedDownBarStock
50348	EDA	COVINGTON	K	LEHMANN 2H	ScottThomas		2018-03-08	PCS	45	TurnedDownBarStock
50348	EDA	COVINGTON	K	LEHMANN 2H	ScottThomas		2018-03-08	PCS	45	TurnedDownBarStock
50329	EDA	COVINGTON	C	VALLDES 3HA	ScottThomas		2018-03-08	Priority	660	TurnedDownBarStock
50326	EDA	COVINGTON	C	VALLDES 6H	ScottThomas		2018-03-08	Priority	1632	TurnedDownBarStock
50497	EDA	COVINGTON	C	VALLDES 2HR	ScottThomas		2018-03-08	PCS	612	TurnedDownBarStock

And then another day...

- We had created a monster!
 - Multiple views for each survey at varying time scales
 - Very limited formatting
 - Inflexible
 - ***TIME CONSUMING***



Because of that...

- We realized that we had to modernize how we managed Survey123 data
 - Increase end user responsibility
 - Additional structure and format
 - Add flexibility
 - Reduce GIS/IT staff time



Because of that...

- We already had tools in place that we could use
 - Microsoft Visual Studio
 - Team Foundation Server (TFS)
 - SQL Server Reporting Services
 - › Report Server already in use for our production system



Visual Studio & TFS


File Edit View Project Build Debug Team Test Analyze Tools Extensions Window Help Search Visual Studio (Ctrl+Q) SURVEY_123

PRD Default Start Calibri 8pt B / U A [font settings] Solid 1 pt Black [color settings]

Report Data [x] BLOWDOWN_LOG.rdl [Design]* MIA_INSPECTION_Q...MARY.rdl [Design]

Design Preview

START_DATE [calendar icon] END_DATE [calendar icon]

 **BLOWDOWN LOG**
Start Date: [START_DATE] | End Date: [END_DATE]

FILENUM	Blowdown Date	Area	Prospect	Pad	Well Name	Welltender	Welltender - Other	Starting Pressure (PSIG)	Ending Pressure (PSIG)	Blowdown Duration (Mins.)	What Was Blowdown	W
[FILENUM]	[Blowdown_Date]	[Area]	[Prospect]	[Pad]	[Well_Name]	[Welltender_Nar]	[Welltender_Nar]	[Starting_Pressur	[Ending_Pressure	[Blowdown_Dura	[What_Was_Blow	[W

[EXECUTED BY]
[REPORT NAME]

[EXECUTION TIME]
[PAGE COUNT]

Report Data [x] Built-in Fields Parameters Images Data Sources Apps Datasets BLOWDOWN_LOG FILENUM Blowdown_Date Area Welltender_Name Welltender_Name__Other Prospect Pad Well_Name Starting_Pressure__PSIG_ Ending_Pressure__PSIG_ Blowdown_Duration__Mins_ What_Was_Blowdown_ Work_Performed_Work_Done

Visual Studio & TFS

History - BLOWDOWN_LOG.rdl | BLOWDOWN_LOG.rdl [Design]* | MIA_INSPECTION_Q...MARY.rdl [Design]

Source location: H:\TFS\SSRS Reports\SURVEY_123\SURVEY_123\BLOWDOWN_LOG.rdl

Changesets | Labels

Changeset	Change	User	Date	Path	Comment
5639	edit	Gary Bowles	2/28/2019 10:57:41 AM	\$/SenecaR...	
5632	edit	Wes May	2/26/2019 12:55:20 PM	\$/SenecaR...	
5621	add	Wes May	2/25/2019 12:24:48 PM	\$/SenecaR...	

Solution Explorer

Search Solution Explorer (Ctrl+):

- Solution 'SURVEY_123' (1 project)
 - Shared Data Sources
 - Apps.rds
 - Development.rds
 - Geology.rds
 - Shared Datasets
 - Reports
 - BLOWDOWN_LOG.rdl**
 - ESD_EDA_INSPECTION.rdl
 - ESD_WDA_INSPECTION.rdl
 - HFS_BROOKFIELD_DAILY_INSPECTION.rdl
 - HFS_BROOKFIELD_DAILY_INSPECTION_EXPORT.rdl
 - HFS_CCTF_DAILY_INSPECTION.rdl
 - HFS_CCTF_DAILY_INSPECTION_EXPORT.rdl
 - HFS_CSF_DAILY_INSPECTION.rdl
 - HFS_CSF_DAILY_INSPECTION_EXPORT.rdl
 - HFS_CSF_MONTHLY_INSPECTION.rdl
 - HFS_CSF_MONTHLY_INSPECTION_EXPORT.rdl
 - HFS_FWI_INSPECTION.rdl
 - HFS_JAMES_CITY_DAILY_INSPECTION.rdl
 - HFS_JAMES_CITY_DAILY_INSPECTION_EXPORT.rdl
 - HFS_MONTHLY_TANK_INSPECTION.rdl
 - HFS_PAD_INSPECTION.rdl
 - MIA_INSPECTION_DEP_EXPORT.rdl
 - MIA_INSPECTION_EXPORT.rdl
 - MIA_INSPECTION_QUARTER_SUMMARY.rdl
 - MIA_INSPECTION_UDEV.rdl
 - MONTHLY_LDAR_INSPECTION.rdl
 - MONTHLY_PLUNGER_INSPECTION.rdl

Seneca Report Server

Case Study - Mechanical integrity Assessment (MIA)

- The Mechanical Integrity Assessment (MIA) is a regulatory-based process used to inspect, assess and record quarterly well integrity data for operating oil and gas wells. This quarterly inspection is required by regulation under 25 Pa. Code § 78.88, Mechanical Integrity of Operating Wells.
 - Quarterly inspection for unconventional wells
 - Annual inspection for convention wells



Out with the Old...

- Well tenders collect Survey123 data
- Barcode/Pulldata used to populate hidden fields (data required for regulatory reporting)
- New wells required update to pulldata .csv file and re-publish of survey
- SRCX staff reviews quarterly data in Excel
- Data clean up performed by Geomatics staff
- Determine missing inspections
- Prepare annual regulatory submission

In with the New...

- Removed well list data
- Made it easier to edit submitted data
- Updated Reports
 - Raw data export
 - Used by Quarter to audit inspection activity
 - Generates the DEP report data in a format that allows cut/paste to DEP reporting spreadsheet
- Create new well list source

Seneca Report Server

Survey123 - Looking Forward

- Data Driven notifications
 - GeoEvent Server
 - Existing IT infrastructure
 - MS Flow
 - Integromat
 - SQL Server database triggers
- FME for data transfer
- External receiver for point locations
- Ops Dashboard
- Fine tune surveys to align with company wide databases

Questions

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Thank You

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