

GL Noble Denton

Stoner Pipeline Simulator (SPS)



IGU WOC3 Meeting (Houston, Texas, USA)
SPS and Uptime Solution Presentation
October 3, 2013



Agenda

- Introduction to GL Noble Denton
- Stoner Pipeline Simulator Overview
- Uptime Integrity Management Solution Overview
- Questions and Discussion

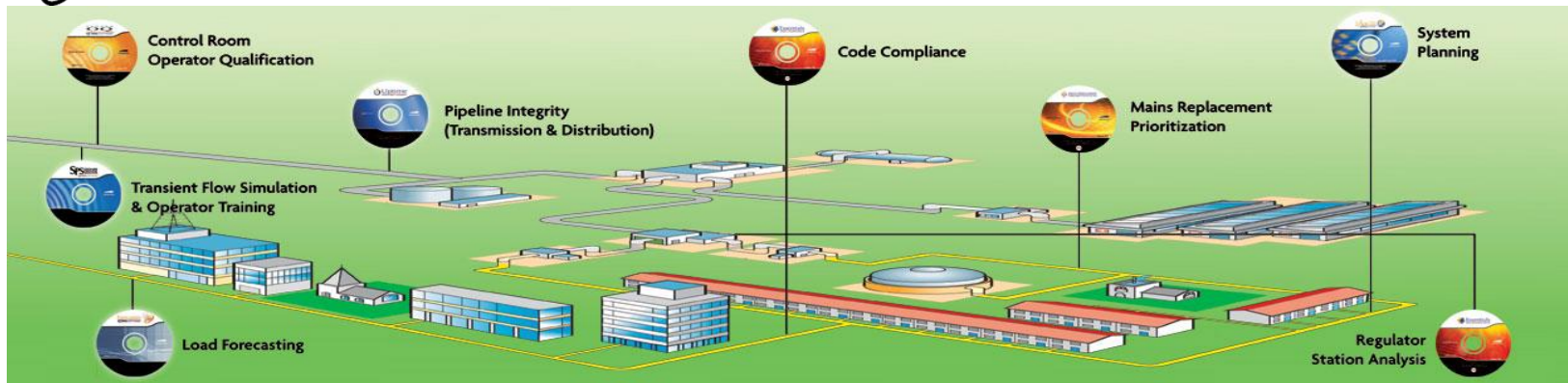
Jim Short – Senior Consultant
Geoff Craig – Senior Consultant

GL Noble Denton's Oil and Gas Business

Assurance	Advanced Engineering & Consulting	Software Solutions	Marine Operations	Project Execution
Certification Verification Inspection and quality assurance	Analysis and engineering consulting Field development planning Testing services Asset integrity management Asset optimisation Safety and risk Transmission and distribution	Regulatory compliance Asset optimisation Control room management Simulation Leak Detection Asset Integrity Management	Marine warranty Marine consulting Marine casualty investigations Marine operations Dynamic positioning	Project management Design Transportation and installation Due diligence Construction monitoring

... Full range of planning, operations and decision support products

STERNERSOFTWARE



GL Noble Denton

A Trusted Solution Provider

- **STENER** SOFTWARE®, family of Integrated Products and Solutions
- Commitment to Client Services and Satisfaction
- Dedication to Energy Industry – Quality Products and Services
- Continued Product Growth and Evolution
- Pipeline Industry Participation
 - American Petroleum Institute (API)
 - International Pipeline Conference (IPC)
 - Pipeline Simulation Interest Group (PSIG)
 - Gas Technology Institute (GTI)
 - Pipeline Research Council International (PRCI)
 - International Gas Union (IGU)

A Trusted Advisor

A Broad Range of Oil & Gas, Water and Power Clients

Utilities (Gas, Water & Power)

National Oil & Gas Companies

International Oil & Gas Companies

Independent Oil & Gas Companies



Gas Pipeline Simulation Offerings

- SynerGEE
- Gas Transient Optimization (GTO)
- Stoner Pipeline Simulator (SPS)

The Building Blocks of SPS



Typical SPS Offline Applications

- Pipeline and control system design
- Capacity studies
- Analyzing startup and shutdown procedures
- Studying economics of design / operating strategies
- Surge analysis / Relief systems
- Pipeline expansion / De-bottlenecking
- Studying survival time for gas delivery systems
- Leak Simulation

Typical SPS Control Room Applications

- Leak Detection
- Linepack analysis
- Maintenance and short-term planning (planning predictor model - PPM)
- Survival time calculations (automatic look-ahead - ALAM)
- Short-term planning
- Long-term planning

Native "Engineering" GUI

PIPES

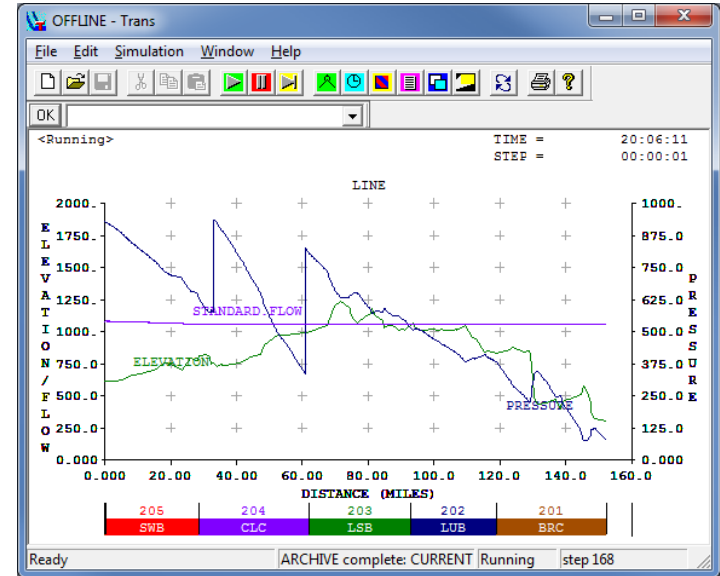
File Edit Simulation Help

Edit Report Sort... Copy

Simulation Time: 20:10:47
Time Step: 00:00:01

Auto Refresh Refresh [Play] [Stop] [Refresh]

Device	Upstream Pres.	Downstream Pres.	Length	Inventory
ML_000.0	940	853	8.439	16.356
ML_008.5	853	590	24.389	47.520
ML_033.0	936	788	8.191	15.959
ML_041.2	788	336	19.946	38.787
ML_061.2	825	733	6.634	12.835
ML_067.9	733	493	29.694	57.795
ML_097.6	493	75	55.154	107.094



PIPES

File Edit View Insert Draw Tools Window Help

Model Explorer

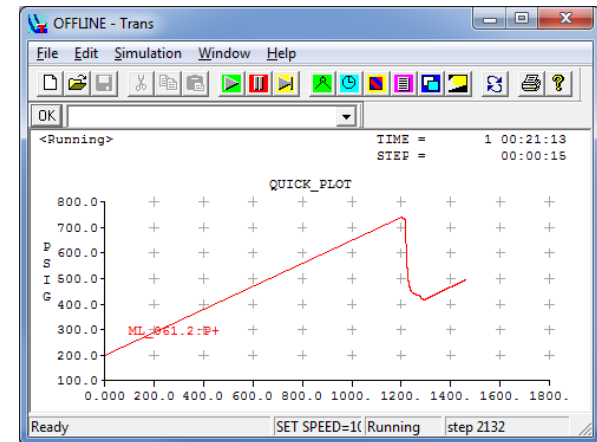
- offline.inprep
 - Options
 - Nodes and Externals
 - Online
 - Pipes
 - Valves and Regulators
 - Pumps, P
 - Tanks
 - Control Elements
 - Others

Types Stations

offline.inprep offline.inprep

zoom:100% x:1322 y:34

Ready



Case History - Sasol Gas

”Sasol Gas has decided to implement a Pipeline Management System utilizing simulation software to benefit the operation, planning and management of their gas networks”

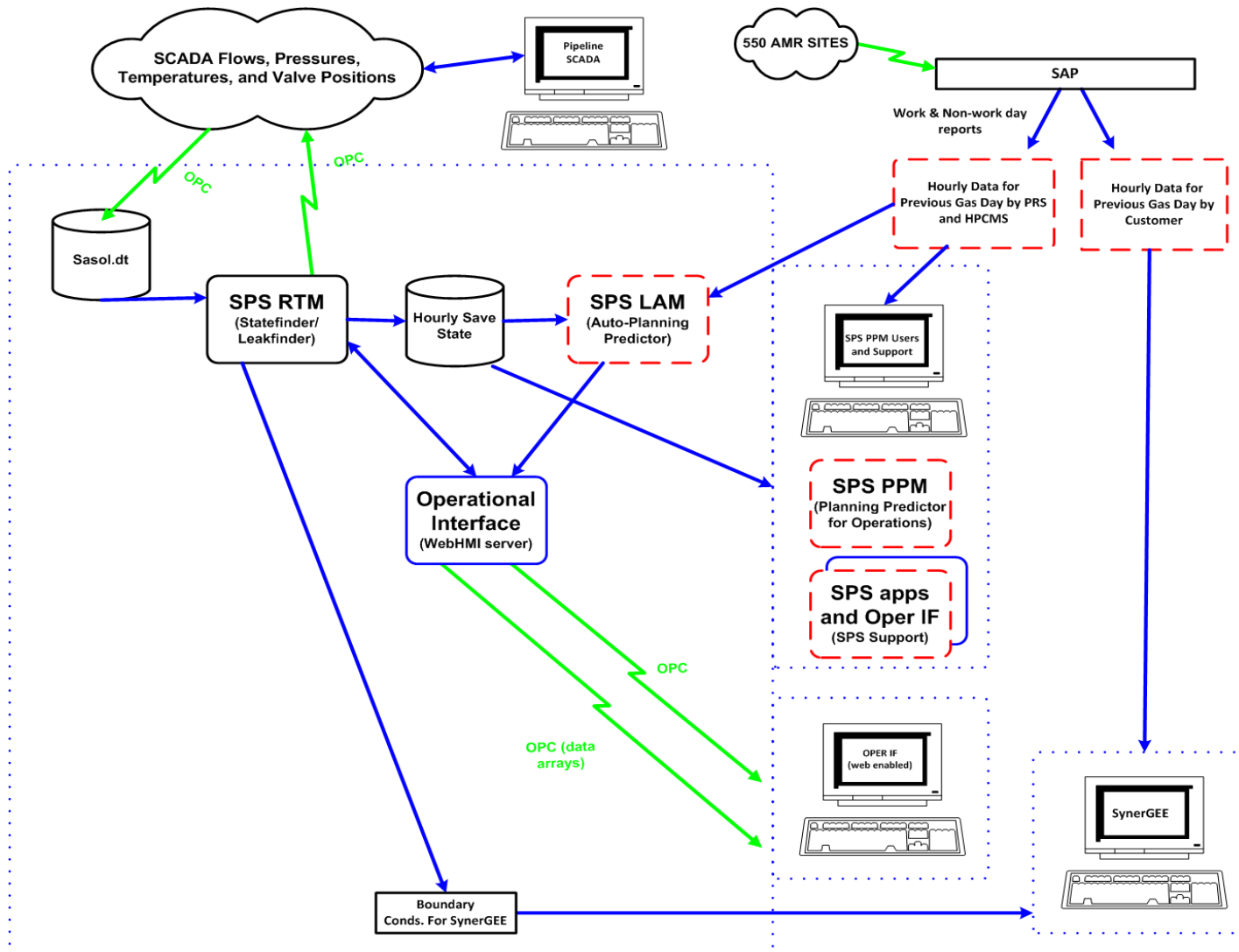
Real-time Simulation Capabilities (SPS)

- Operations support (Real-time, Predictor, and Survival Time)
- Linepack calculations; planning tools
- “Virtual SCADA” flow and pressure calculations
- Leak detection

Offline Simulation Capabilities (SynerGEE)

- Network planning; regulator sizing; de-bottlenecking
- Users
 - Marketing department
 - Engineering
 - Sastech
- GIS based interface

SPS System Architecture



Control Room Displays

MAIN

←
🏠
→

MSP
GTN
SWM
KZN

Alarms

Reports

System Time: 06:05:45 PM
 Model Time: 06:04:28 PM

Map Data:

- Temane: 264512.82, 11001.36
- Babelegi: 3159.27, 3519.11
- Middleburg: 240.00, 2648.24
- Secunda 1: 9507.22, 6645.08
- Secunda 2: 306355.12, 6645.08
- Durban: 5095.96

Linepack vs Time

Flow, MAOP, Pressure, Temperature vs Mozambique Distance

Flow, MAOP, Pressure, Temperature vs Secunda to Sasolburg Distance

	Linepack (m3)	Energy Linepack (GJ)	Survival time (mins)	
MSP	30892770	1182500	720	Report
GTN	3639754	140578	720	Report
SWM	399081	15414	720	Report
KZN	4499760	173794	720	Report

POD Alarms

MSP

GTN

SWM

KZN

Time / Date	Description	Information One	Information Two	Comment
06:03:54 PM 2009/08/2	Pod flow rate returned to below contractual level	EGOLI Calculated outflow (m3/hr): 660.94720	Contractual flow (m3/hr): 1475.4100	
05:46:53 PM 2009/08/2	Pod Contractual flow rate exceeded	NOVAMODA Calculated outflow (m3/hr): 2712.6201	Contractual flow (m3/hr): 2736.4399	
05:46:13 PM 2009/08/2	Pod flow rate returned to below contractual level	EVERITE Calculated outflow (m3/hr): 1356.9978	Contractual flow (m3/hr): 1358.3199	

Done
Local intranet

Alarms

ALARMS		←	🏠	→	MSP	GTN	SWM	KZN	Alarms Inventory	Reports Profiles	System Time: 06:09:42 PM
Time / Date	Description	Information One			Information Two			Comment			
06:08:55 PM 2009/08/2	Pod flow rate returned to below contractual level	EGOLI Calculated outflow (m3/hr): 664.27685			Contractual flow (m3/hr): 1475.4100						
06:05:55 PM 2009/08/2	Pod flow rate returned to below contractual level	COROBRIK Calculated outflow (m3/hr): 1774.6751			Contractual flow (m3/hr): 1756.4399						
05:46:53 PM 2009/08/2	Pod Contractual flow rate exceeded	NOVAMODA Calculated outflow (m3/hr): 2712.6201			Contractual flow (m3/hr): 2736.4399						
05:46:13 PM 2009/08/2	Pod flow rate returned to below contractual level	EVERITE Calculated outflow (m3/hr): 1356.9978			Contractual flow (m3/hr): 1358.3199						
05:44:53 PM 2009/08/2	Pod flow rate returned to below contractual level	SCI Calculated outflow (m3/hr): 115422.78			Contractual flow (m3/hr): 116152.22						
05:28:13 PM 2009/08/2	Pod flow rate returned to below contractual level	SECUNDA Calculated outflow (m3/hr): 43649.839			Contractual flow (m3/hr): 45995.320						
06:22:13 PM 2009/08/2	Pod Contractual flow rate exceeded	HIGHVELD Calculated outflow (m3/hr): 16648.951			Contractual flow (m3/hr): 12223						
05:08:14 PM 2009/08/2	Pod Contractual flow rate exceeded	BABELEGI Calculated outflow (m3/hr): 2995.0795			Contractual flow (m3/hr): 2810.3000						
05:04:12 PM 2009/08/2	MSP Leak Alarm cleared	Est. Leak Rate (m3): 535.173			Est. Leak Location (km): 908.5						
04:58:49 PM 2009/08/2	Pod Contractual flow rate exceeded	DYNAMIC Calculated outflow (m3/hr): 5029.5781			Contractual flow (m3/hr): 6149.8828						
04:58:42 PM 2009/08/2	Pod flow rate returned to below contractual level	MEYERTON Calculated outflow (m3/hr): 3085.4274			Contractual flow (m3/hr): 7756.4501						
04:58:27 PM 2009/08/2	GTN Model caught up with realtime	Current lag behind realtime (mins): 7.409									
04:56:50 PM 2009/08/2	GTN model available	Current lag behind realtime (mins): 44.40									
04:56:50 PM 2009/08/2	KZN model available	Current lag behind realtime (mins): 1.366									
04:56:50 PM 2009/08/2	MSP model available	Current lag behind realtime (mins): 1.166									
04:56:50 PM 2009/08/2	SWM model available	Current lag behind realtime (mins): 1.116									
04:46:10 PM 2009/08/2	MAOP cleared in model SWM										
04:44:54 PM 2009/08/2	MAOP cleared in model MSP										
03:52:59 PM 2009/08/2	Pod Contractual flow rate exceeded	HILLSIDE Calculated outflow (m3/hr): 44384.621			Contractual flow (m3/hr): 27517.564						
12:31:51 PM 2009/08/2	Pod Contractual flow rate exceeded	COLUMBUS Calculated outflow (m3/hr): 13255.905			Contractual flow (m3/hr): 10370						
11:19:10 AM 2009/08/2	Pod Contractual flow rate exceeded	DYECHEM Calculated outflow (m3/hr): 3089.7658			Contractual flow (m3/hr): 1065.5799						

Time / Date	Description	Information One		Information Two	Comment
06:08:55 PM 2009/08/2	Pod flow rate returned to below contractual level	EGOLI Calculated outflow (m3/hr): 664.27685		Contractual flow (m3/hr): 1475.4100	
06:05:55 PM 2009/08/2	Pod flow rate returned to below contractual level	COROBRIK Calculated outflow (m3/hr): 1774.6751		Contractual flow (m3/hr): 1756.4399	
05:46:53 PM 2009/08/2	Pod Contractual flow rate exceeded	NOVAMODA Calculated outflow (m3/hr): 2712.6201		Contractual flow (m3/hr): 2736.4399	



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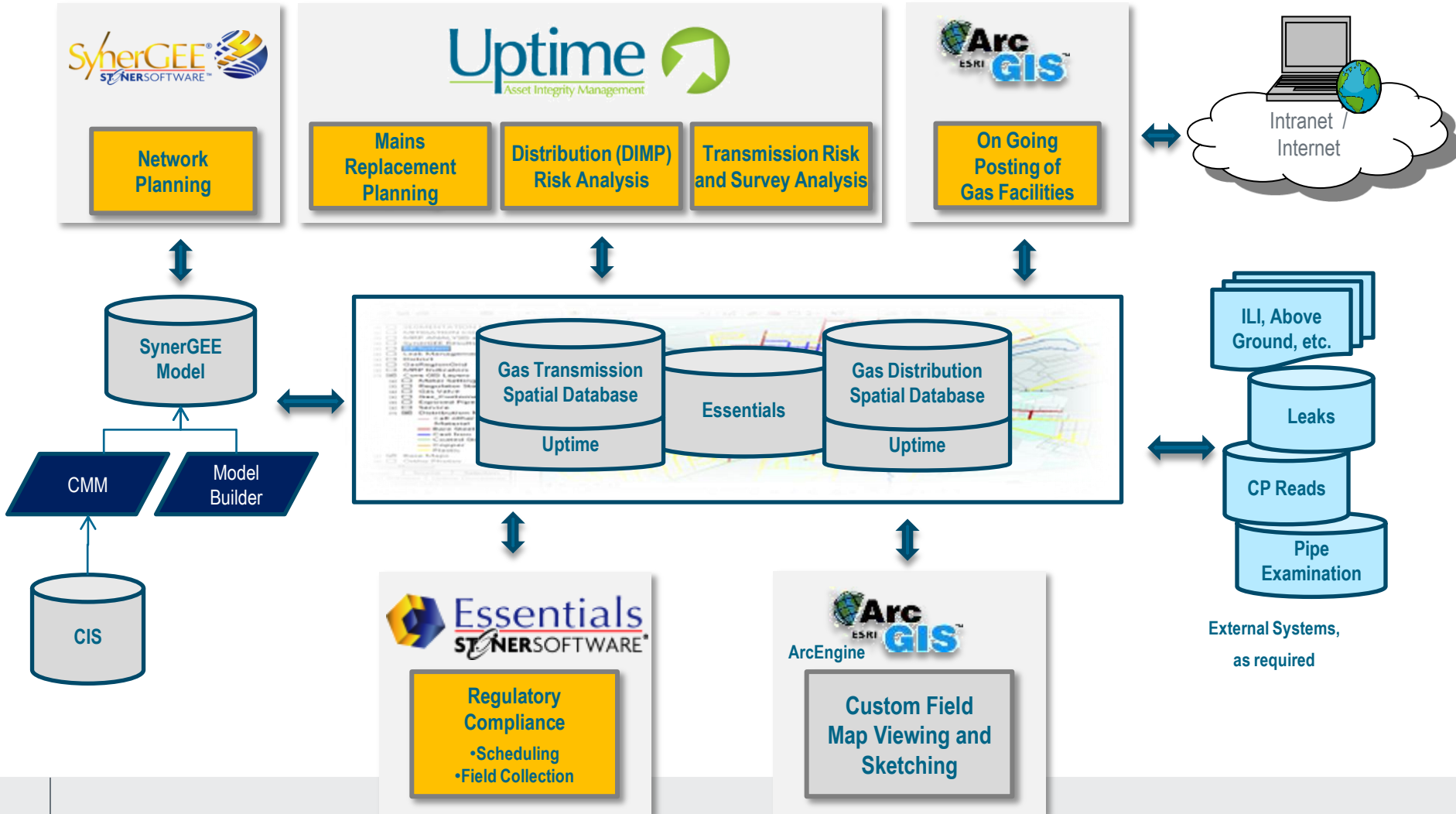
Uptime Integrity Management Solution



Geoff Craig, Senior Consultant

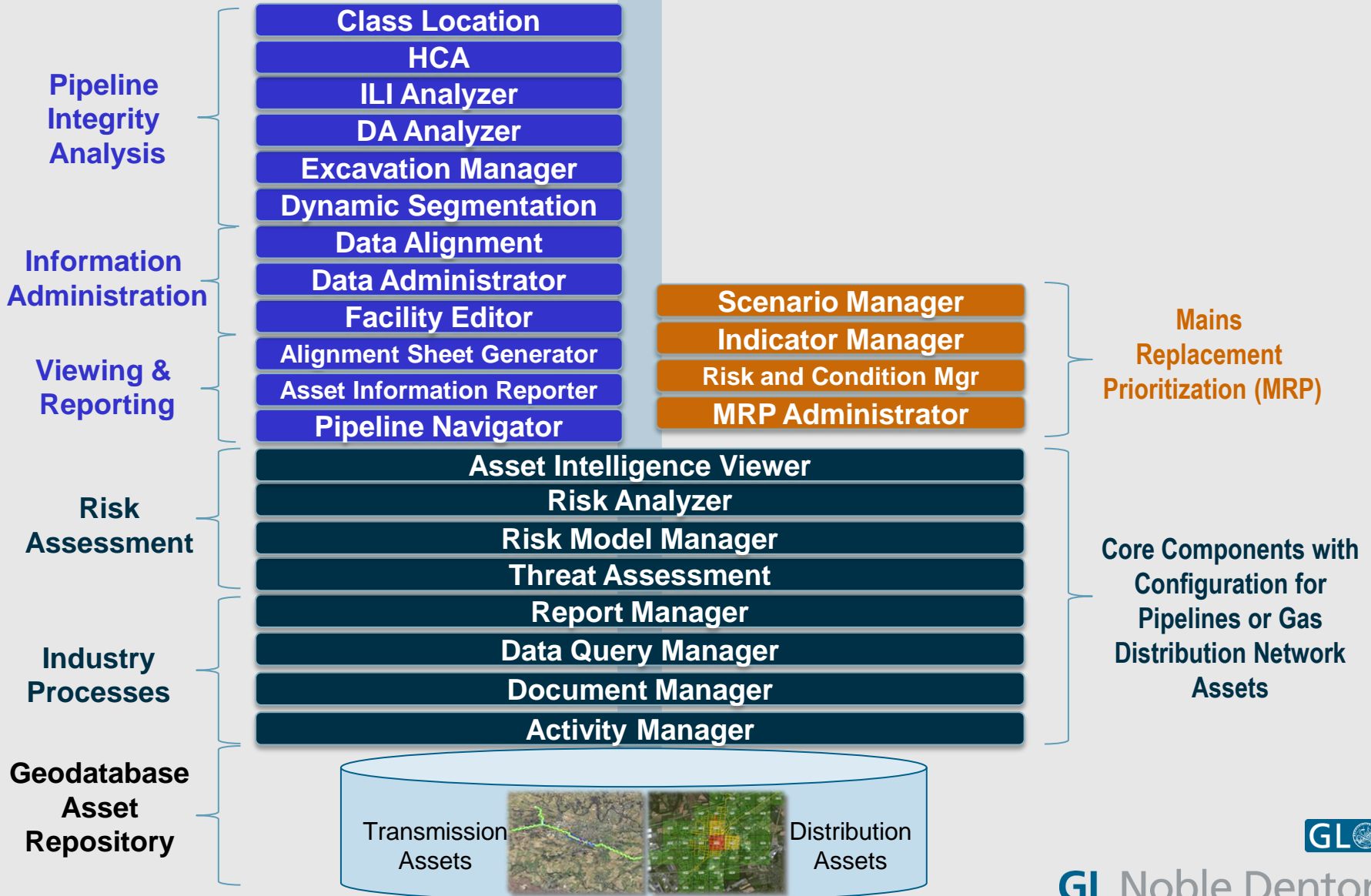
Part of the

STNERS SOFTWARE[®] ly of Integrated Products and Solutions.

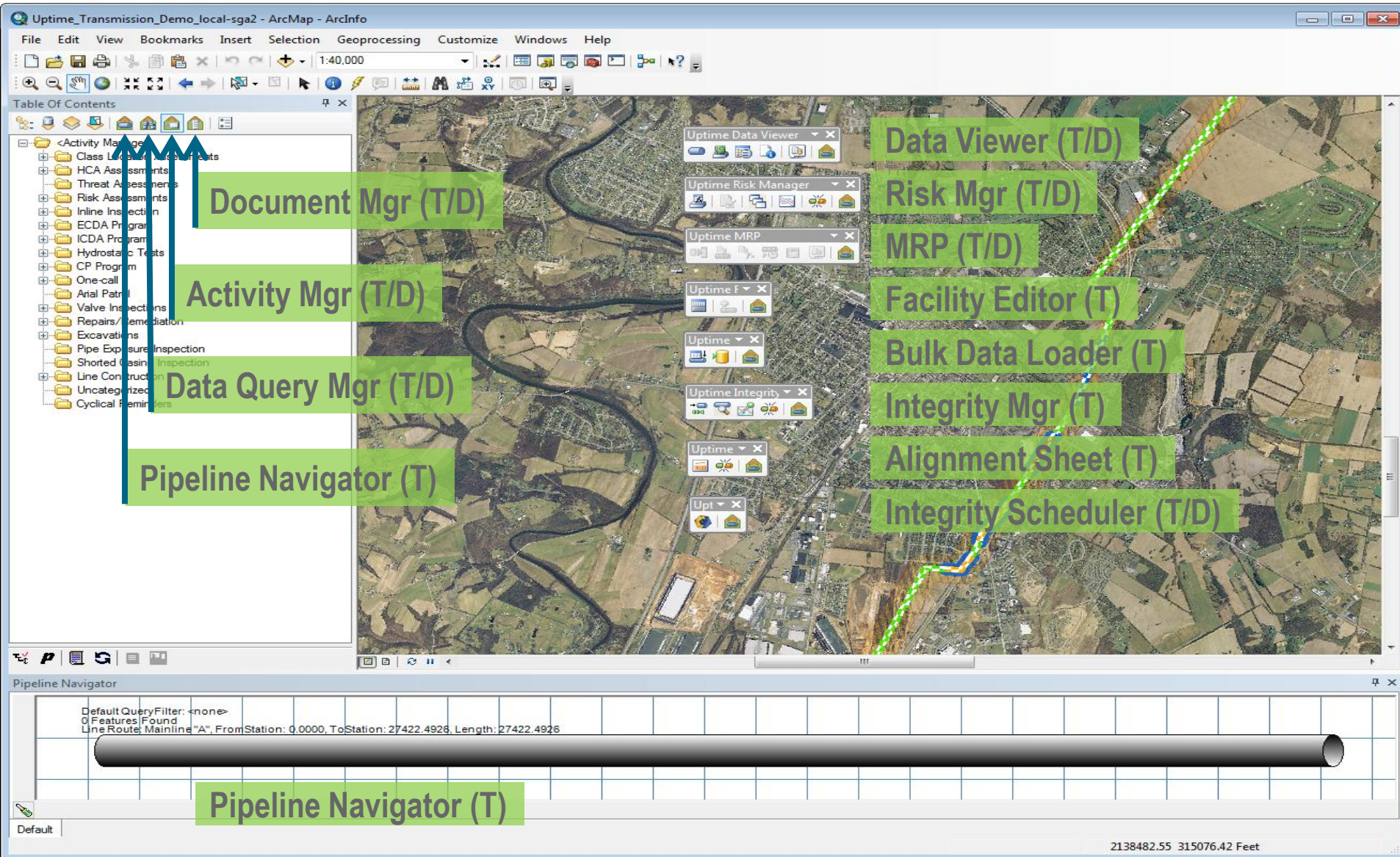


Single Solution for Pipeline and Distribution

Pipeline ← → Distribution



Seamless Integration with GIS



Uptime_Transmission_Demo_local-sga2 - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:40,000

Table Of Contents

- <Activity Manager
- Class Legend
- HCA Assessments
- Threat Assessments
- Risk Assessments
- Inline Inspection
- ECDA Program
- ICDA Program
- Hydrostatic Tests
- CP Program
- One-call
- Aerial Patrol
- Valve Inspections
- Repairs/Remediation
- Excavations
- Pipe Exposure Inspection
- Shorted Gasline Inspection
- Line Construction
- Uncategorized
- Cyclical Repairs

Uptime Data Viewer (T/D)

Uptime Risk Manager (T/D)

Uptime MRP (T/D)

Uptime F (T)

Uptime (T)

Uptime Integrity (T)

Uptime (T)

Upt (T)

Document Mgr (T/D)

Activity Mgr (T/D)

Data Query Mgr (T/D)

Pipeline Navigator (T)

Data Viewer (T/D)

Risk Mgr (T/D)

MRP (T/D)

Facility Editor (T)

Bulk Data Loader (T)

Integrity Mgr (T)

Alignment Sheet (T)

Integrity Scheduler (T/D)

Pipeline Navigator

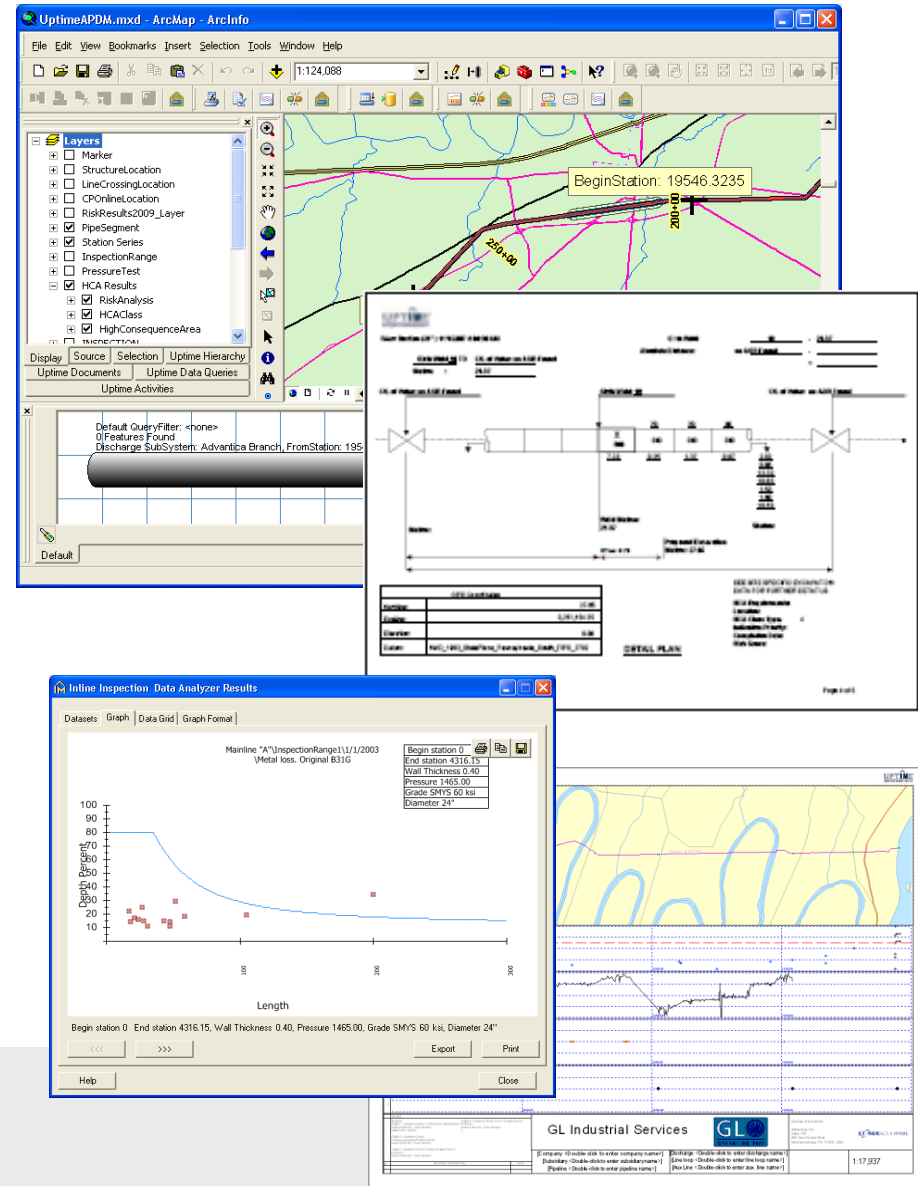
Default Query Filter: <none>
0 Features Found
Line Route: Mainline "A", From Station: 0.0000, To Station: 27422.4926, Length: 27422.4926

Pipeline Navigator (T)

2138482.55 315076.42 Feet

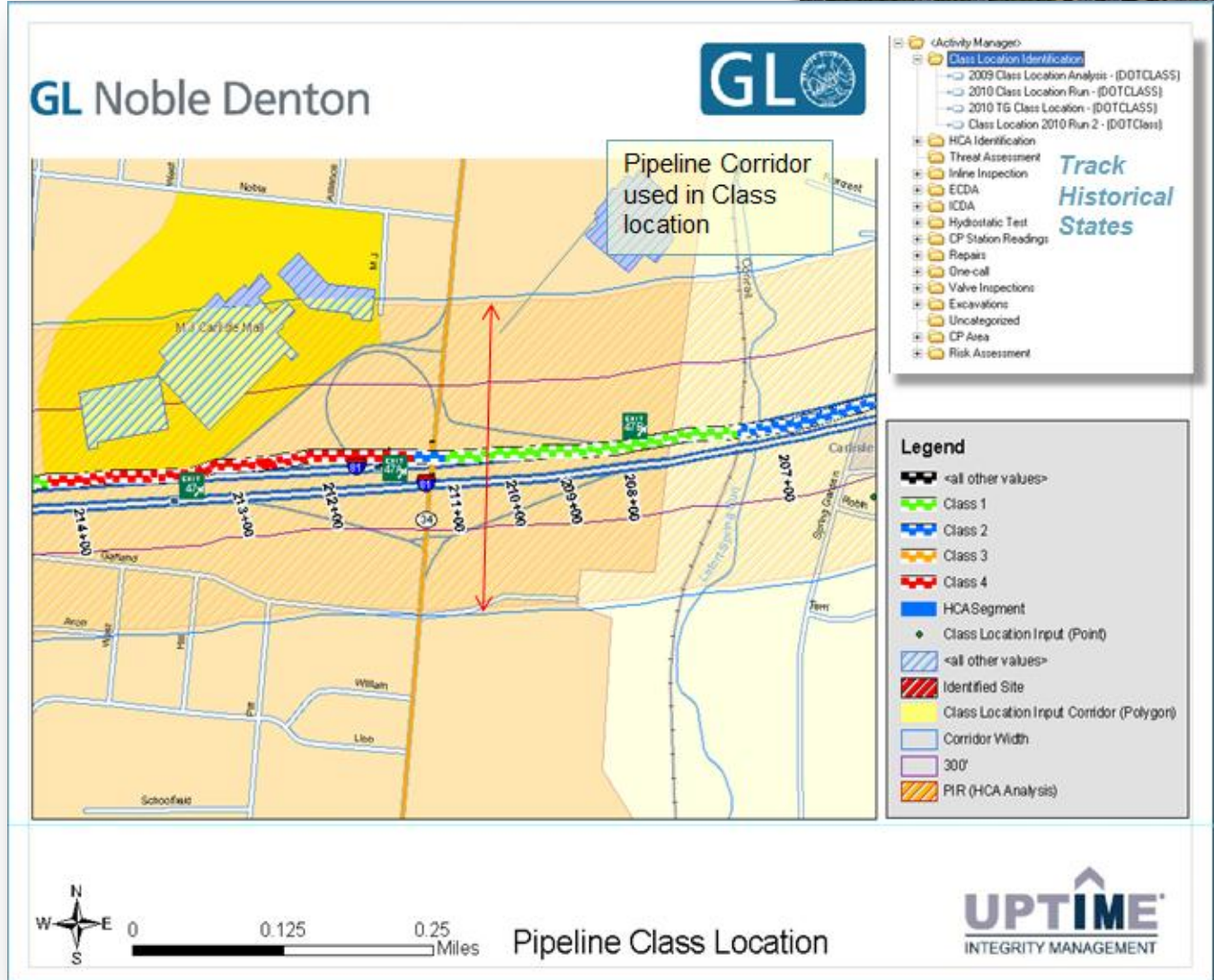
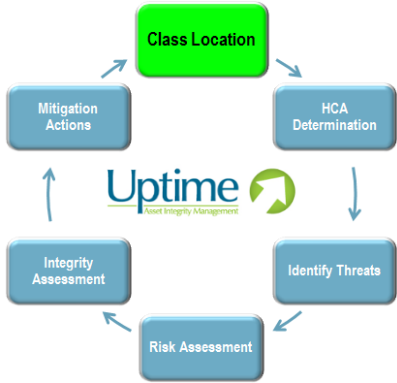
Uptime For Pipeline Assets

- **Class Location and HCA Calculator**
 - CFER Circle, Sliding Mile, Clustering
- **Develop and Execute Risk Models**
 - Preconfigured NGA (Kiefner) Model
 - Others – Muhlbauer, etc.
- **Integrity Assessment Data Management**
 - Multi-vendor support
 - Import, Align, Analyze
 - ILI, CIS, DCVG, ECDA, etc.
- **Defect Analysis**
 - B31G, RSTRENG
 - MAOP, Safe Op Pressure, etc.
- **Productivity and Analysis Tools**
 - Excavation Management, Dig Sheets, etc.
 - Interactive Alignment Sheet Generator
- **MAOP Verification and Tracking**

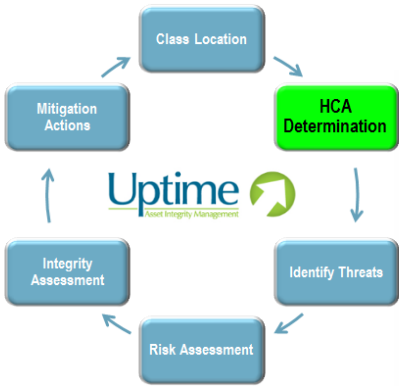


The screenshot displays the Uptime software interface, which is used for pipeline asset management and analysis. The main window shows a map of a pipeline segment with various layers and data points. A callout box indicates a 'Begin Station: 19546.3235'. Below the map, there is a table with columns for 'Station', 'Length', 'Pressure', and 'Diameter'. To the right, a schematic diagram of a pipeline segment is shown, including valves and pipe sections. Below the schematic, there is a table with columns for 'Station', 'Length', 'Pressure', and 'Diameter'. At the bottom, there is a graph showing 'Depth' versus 'Length' for a pipeline segment. The graph includes a blue curve representing the pipeline profile and red squares representing data points. The graph is titled 'Mainline "A" InspectionRange11/11/2003 VMetal loss, Original B31G'. The graph shows a depth of approximately 100 feet over a length of 300 feet. The graph also includes a table with columns for 'Begin station 0', 'End station 4316.15', 'Wall Thickness 0.40', 'Pressure 1465.00', 'Grade SMYS 60 ksi', and 'Diameter 24"'. The graph has buttons for 'Export', 'Print', 'Help', and 'Close'. The bottom of the screenshot shows the 'GL Industrial Services' logo and contact information.

Uptime: Pipeline Integrity Management



Uptime: Pipeline Integrity Management



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Navigate to HCA Segments

- Company
- Susquehanna Transmission
 - LineLoop
 - Mainline "A"
 - Discharge SubSystem
 - Advantica Branch
 - Casing
 - 21151.8728
 - UTEExcavation
 - Valve
 - HCASegment**
 - 20140.9445
 - 20140.9469
 - 20140.9468
 - 20140.9468
 - 21144.0604
 - 21144.0604
 - 21150.3809
 - 21330.0386
 - 21330.0386
 - 21871.348
 - 21871.348

- Huntington Ridge
- River Section
- SubSystem
- Cumberland County Pipeline System

HCASegment

Defect Depth (%)

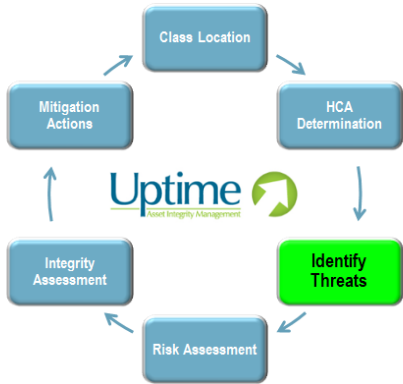
Depth Percent

- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60

World Imagery
Low-Resolution (15m) Imagery

Pipeline HCA Analysis

Uptime: Pipeline Integrity Management



Threat Assessment - Threat Assessment Questionnaires - Uptime Threat Assessment...

Items to analyze: 5 polylines from feature class Casing

Answer the following questions to assess the threat credibility for the items to analyze.

AC current density > 2A/R?

Equipment Failure External Corrosion Incorrect Operation Internal Corrosion MIC

Nu.	Question	Answer
1	Evidence of external corrosion from in-pipe inspection or dir...	Yes
2	History of failures from external corrosion?	Unknown
3	History of external corrosion failures requiring repair?	Yes
4	Cathodic protection quality?	Unknown
5	Mainline coating type?	Tape
6	Field joint coating type?	Bitumen
7	Pipe Coating Condition?	Poor
8	Soil Type?	Clay or Rocks
Evidence of AC corrosion...		
9	Presence of high voltage cables?	No
10	Power line voltage > 110 kv?	Yes
11	Distance between power line and pipeline < 550yds?	Unknown
12	Parallelism between power line and pipeline > 1100yds?	Unknown
13	AC current density > 2AR?	Yes

Expert Advice:

Threat Is Credible - External Corrosion may occur on this pipeline. It is recommended that a corrosion mitigation scheme is produced and integrity assessment performed.

Additional Guidance
Threat Is Credible - AC Corrosion is a Credible Threat - This threat can be mitigated through the use of gradient control wires.

Interactive SME Dialog

Report... Import... Export... Cancel

UPTIME Threat Assessment Report **SYNERS SOFTWARE**

Threat Summary

Threat Name: External Corrosion
Is Threat Credible?: True

Threat Information

Questions: 13
Credible Score: 5.00
Credible Threshold: 1.00
Credible Formula: Question1 + Question2 + Question3 + Question4 + Question7 + Question9

Threat "Scoring"

Questions External Corrosion

Question Number	Question	Answer	Answer Score
1	Evidence of external corrosion from in-pipe inspection or direct assessment?	Yes	1
2	History of failures from external corrosion?	Unknown	1
3	History of external corrosion failures requiring repair?	Yes	1
4	Cathodic protection quality?	Unknown	1

Threat report = Expert Advice

Threat Assessment Report **SYNERS SOFTWARE**

Threat Is Credible - External Corrosion may occur on this pipeline. It is recommended that a corrosion mitigation scheme is produced and integrity assessment performed.

Additional Guidance
Threat Is Credible - AC Corrosion is a Credible Threat - This threat can be mitigated through the use of gradient control wires.

Additional Guidance
MIC is a Credible Threat - A more onerous inspection, rehabilitation and repair program may be required on segments that are susceptible to MIC.

Integrity Assessment
The operator has a choice of three integrity assessment methods. The methods are in-line inspection with a tool capable of detecting wall loss such as an MFL tool, performing a pressure test, or, conducting direct assessment. Consultation with Section 6 of ASME B31.8S should be made to ensure that the integrity assessment is carried out correctly.

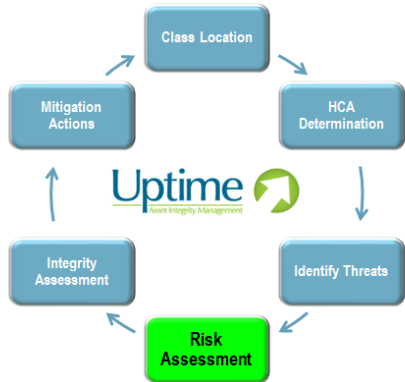
Mitigation
In-line inspection
The response is dependent on the severity of corrosion as determined by calculating critical failure pressure of indications (See ASME B31.8 or equivalent) and a reasonably anticipated or scientifically proven rate of corrosion. Refer to Section 7 of ASME B31.8S for responses to integrity assessment.

Direct Assessment
The response is dependent on the number of indications examined, evaluated and repaired. Refer to Section 7 of ASME B31.8S for responses to integrity assessment.

Pressure Testing
The interval is dependent on the test pressure. If the test pressure was at least 1.39 times MAOP, the interval shall be 10 years. If the test pressure was at least 1.25 times MAOP, the interval shall be 5 years (Refer to Section 7 of ASME B31.8S) for responses to integrity assessment.

The operator shall select the appropriate repair methods as outlined in Section 7 of ASME B31.8(S).

Uptime: Pipeline Integrity Management



Color coded Risk levels

Risk Source; External & Internal Corrosion

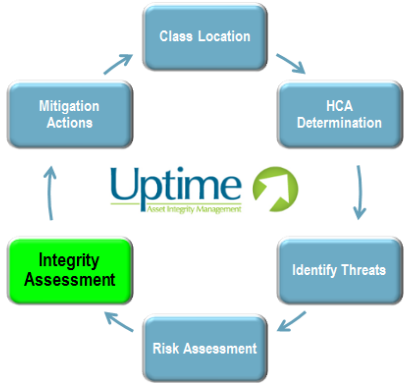
Risk level by segment

Field	Value
CREATEDBY	gilmout
CREATEDDATE	11/18/2010 5:16:30 PM
MODIFIEDBY	gilmout
REMARKS	<Null>
HISTORICALSTATE	1
BeginStation	20590.5892
CoL	2.784114
Susquehanna Transmission	24133.8556
Id	62
Length	5279.706815
LineLoop	Mainline "A"
LineLoopEventID	21d1a9e3-3ca1-4447-9074-bb0e6042cf38
Name	PipeSegment_3
PoFEC	266181.818182
PoFEF	100
PoFIC	322363.927273
PoFIO	900
PoFMD	414.862643
PoFOF	431.627179
PoFSCC	403.227718
PoLEC	239583.636364
PoLEF	75
PoLIC	290127.534545
PoLIO	855
PoLMD	553.150191

Outside Forces Risk of Failure

Segment ID	Risk of Failure
10\PipeSegment_3	~10000
11\PipeSegment_3	~10000
12\PipeSegment_3	~10000
13\PipeSegment_3	~10000
14\PipeSegment_3	~10000
15\PipeSegment_3	~10000
16\PipeSegment_3	~10000
17\PipeSegment_3	~10000
18\PipeSegment_3	~10000
19\PipeSegment_3	~10000
20\PipeSegment_3	~10000
21\PipeSegment_3	~10000

Uptime: Pipeline Integrity Management



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Assess defects with configurable models

Analysis Name	Model Name	ObjectID	Defect
TG Example 19 Nov. 20...	ILI - ASME - B31.85	591	UTMetal_loss_5
TG Example 19 Nov. 20...	ILI Repair Defect Model	590	UTMetal_loss_5
TG Example 19 Nov. 20...		589	UTMetal_loss_5

Cluster of Immediate repairs in area of high IC/EC risk – part in Class 4 area

Defect Distribution

Legend

- Immediate
- < 1 Year
- < 5 Years
- > 5 Years
- External Corrosion
- Equip Fail
- Internal Corrosion
- Incorrect Ops
- Mech Damage
- Outside Forces

Graph of ILI Year of Repair

Pipeline

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Models to help identify segments

Segment	Length	Area	Volume	Weight	Height	Depth	Grade	Diaper
1000	1000	1000	1000	1000	1000	1000	1000	1000

Map context shows indications close to structures in moderate Corrosion risk area

Interactive charts to show indirect survey data

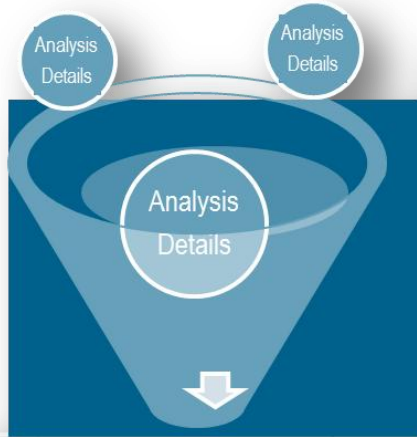
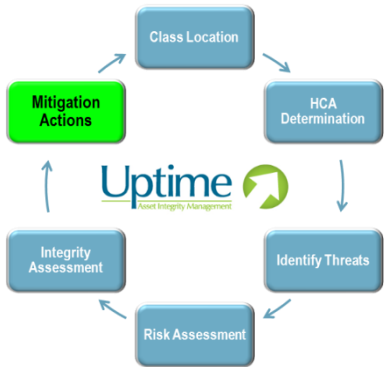
External Corrosion Direct Assessment

Legend

- PoFEC
- PoFIC
- PoSFC
- UT Indication Priority: Immediate, Scheduled, Monitored, Unknown
- CIS Survey - On PS_ON: < -850, > -850
- CIS Survey - Off PS_OFF: < -850, > -850
- Excavation

UPTIME INTEGRITY MANAGEMENT

Uptime: Pipeline Integrity Management



Report

ILI Defect Analysis Model

DOT Class ILI Summary

Count

DOT Class	Response Group						
	media	hedukl - Yr1	hedukl - Yr2	hedukl - Yr3	hedukl - Yr4	hedukl - Yr5	Monitor
Class IV	0	0	0	0	0	0	2
Class III	0	0	0	0	0	0	0
Class II	0	0	0	0	0	0	10
Class I							

Legend: Monitor (Green), Schedule Yr3... (Yellow), Schedule - Yr1... (Orange), Immediate (Red), Uncategorized (Grey)

Report

2010 vs 2011 Risk Analysis

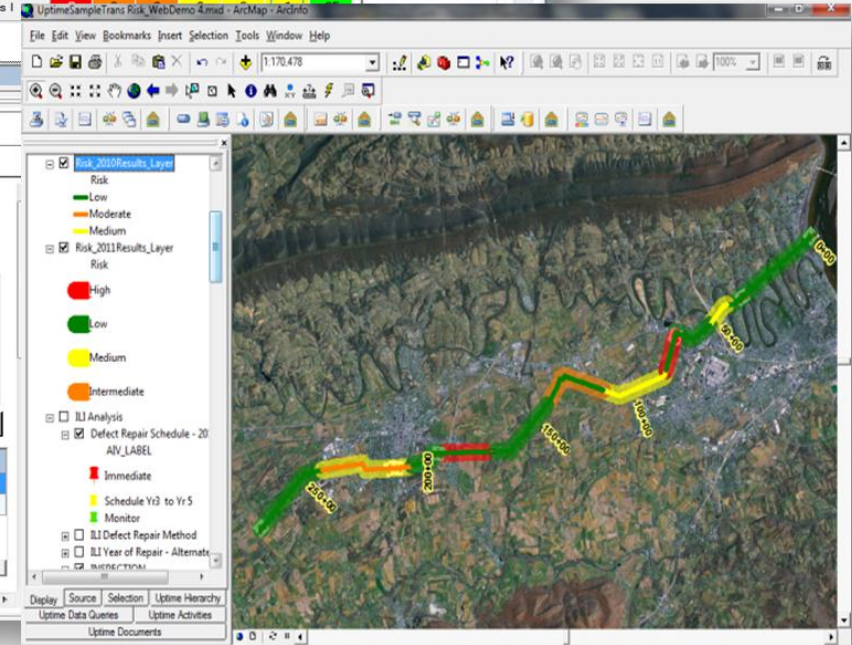
2011 Risk

Count

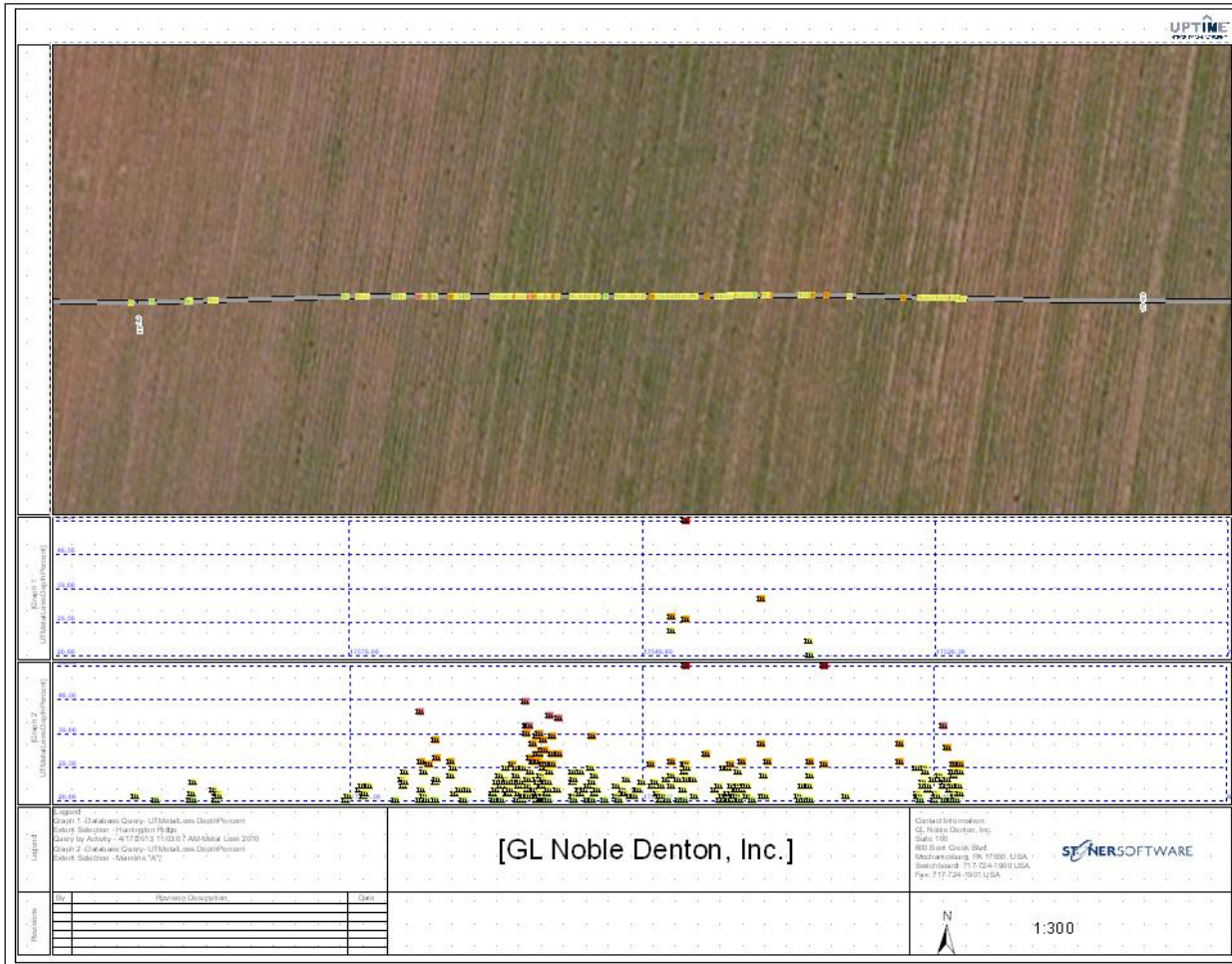
Probability of Failure	Consequence of Failure			
	Low Impact	Medium Impact	High Impact	Severe Impact
Certain	0	0	0	2
Highly Likely	0	0	1	0
Possible	0	3	0	0
Not Likely	5	0	0	0

Legend: Low (Green), Medium (Yellow), Intermediate (Orange), High (Red), Uncategorized (Grey)

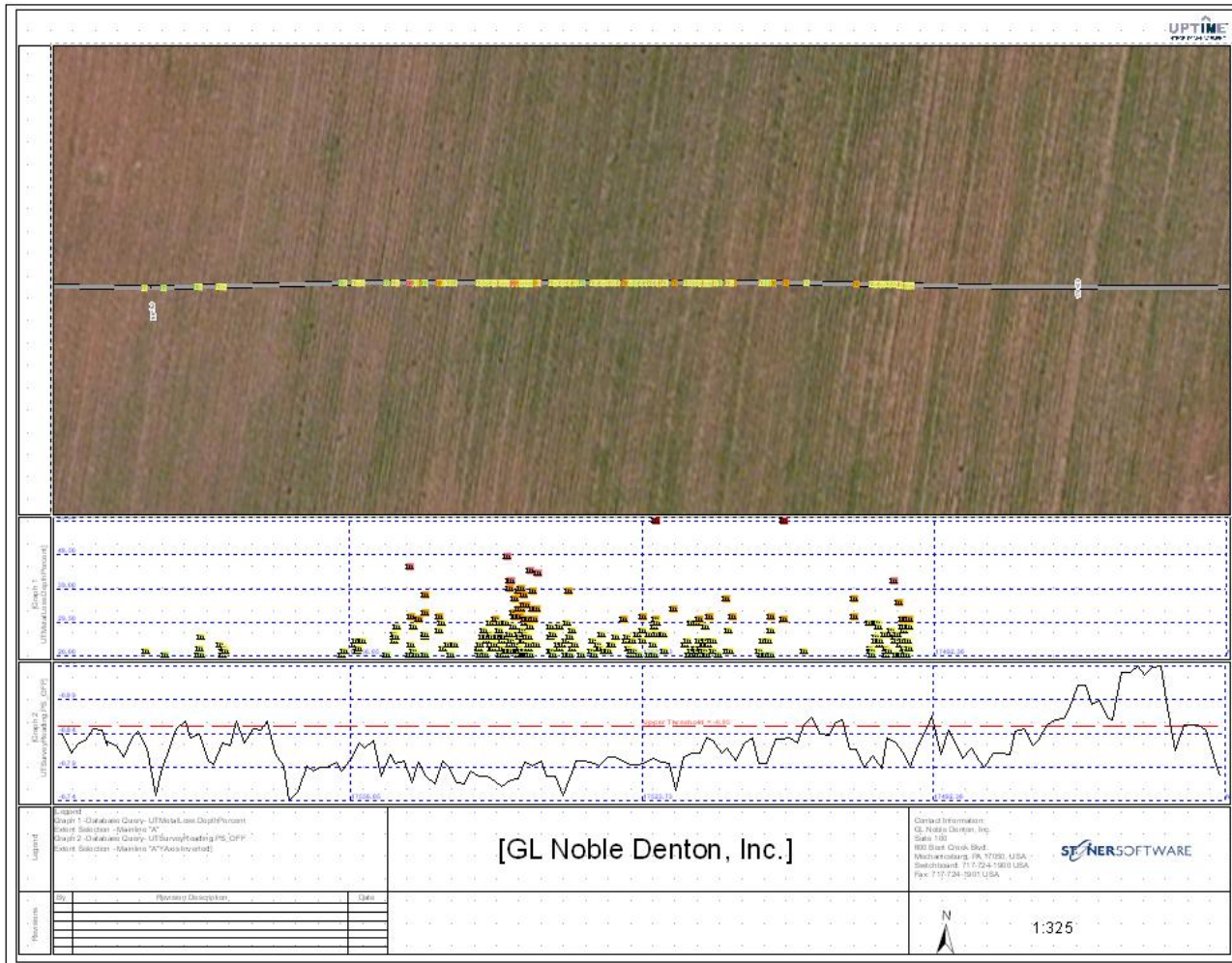
IC	TEMPform	TEMPmin	TPoF	TRoF
18.0381573016...			26119.98571805...	1023773.149485...
73.4341915379...			19457.27534118...	399128.9468093...



Uptime: Worked Example



Uptime: Worked Example



Uptime: Worked Example



Results **Data** Graph Format Graph Analytical Model Results

Defects

Type	STATION	StationSeries	LENGTH	WIDTH	Depth	Depth Percent	Long Seam Orientation
Metal Loss	17,519.41	Huntington Ridge	13.00	17.00		41.00	
Metal Loss	17,531.34	Huntington Ridge	81.00	133.00		58.00	
Metal Loss	17,558.09	Huntington Ridge	646.00	653.00		43.00	
Metal Loss	17,558.99	Huntington Ridge	53.00	97.00		44.00	
Metal Loss	17,561.04	Huntington Ridge	142.00	68.00		41.00	
Metal Loss	17,561.09	Huntington Ridge	18.00	17.00		41.00	
Metal Loss	17,561.22	Huntington Ridge	21.00	20.00		41.00	
Metal Loss	17,561.42	Huntington Ridge	129.00	399.00		48.00	
Metal Loss	17,571.98	Huntington Ridge	131.00	189.00		45.00	
Metal Loss	17,713.64	Huntington Ridge	22.00	29.00		44.00	

Uptime: Worked Example



New ILI Query_2_ILI - ASME - B31.8S - Defect Analysis - (10 Defects Analyzed)

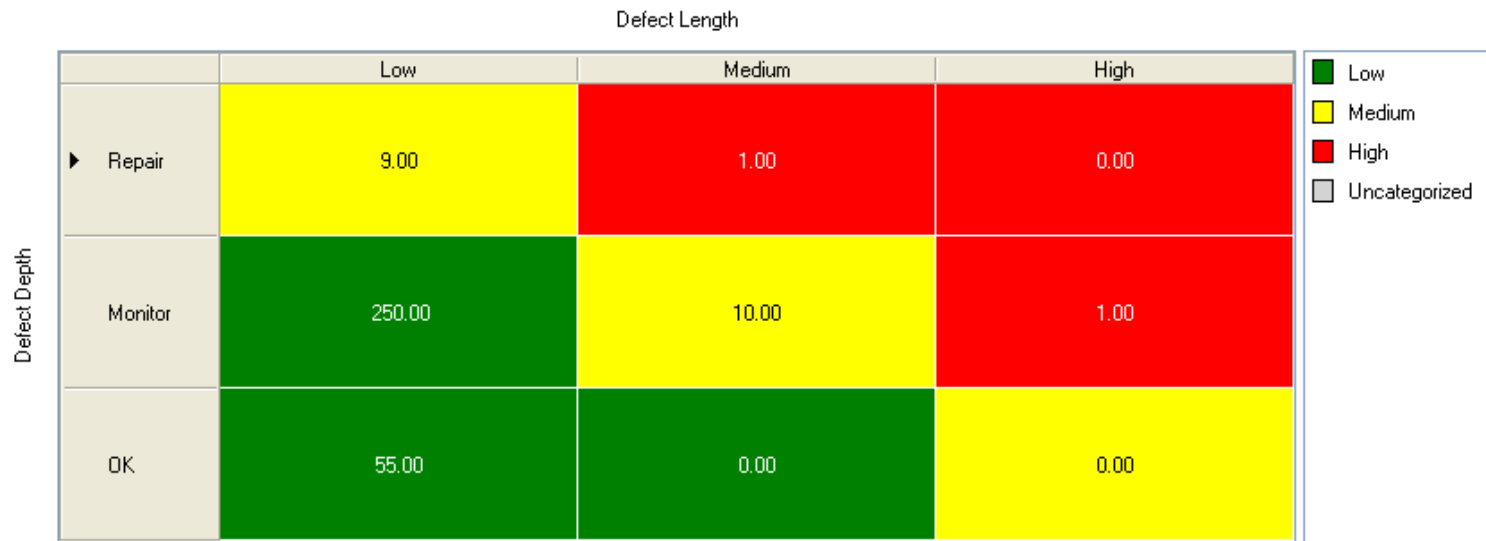
lvStatus	FP0	FPMratio	ImInd	InHca	MeasDepthMI	MitTypes	MitTypes1	NF	NF2	PercSMYS	SchedYr	SOP0
portional	2637.62064...	1.75841376...		0				System__C...	System__C...	63	10	1899.08686...
portional	2586.26384...	1.72417589...		0				System__C...	System__C...	63	10	1862.10997...
portional	2380.15748...	1.58677165...		0				System__C...	System__C...	63	10	1713.71338...
portional	2609.70048...	1.73980032...		0				System__C...	System__C...	63	10	1878.98435...
portional	2549.12313...	1.69941542...		0				System__C...	System__C...	63	10	1835.36865...
portional	2635.52068...	1.75701379...		0				System__C...	System__C...	63	10	1897.57489...
portional	2633.98482...	1.75598988...		0				System__C...	System__C...	63	10	1896.46907...
portional	2555.39969...	1.70359979...		0				System__C...	System__C...	63	10	1839.88778...
portional	2554.38352...	1.70292234...		0				System__C...	System__C...	63	10	1839.15613...
portional	2633.43059...	1.75562039...		0				System__C...	System__C...	63	10	1896.07002...

Uptime: Worked Example



Defect Depth v Defect Length

Count



Details

Data source Metal Loss

Visualize

Uptime: Worked Example



VIEW USER VIEW

Defect Depth v Defect Length

Count

Defect Depth	Defect Length		
	Low	Medium	High
Repair	9.00	1.00	0.00
Monitor	250.00	10.00	1.00
OK	55.00	0.00	0.00

- Low
- Medium
- High
- Uncategorized

Details

RatingColor	RatingLabel	VirtualDataRowId	ClusterNo	ClusterRPR	CLValidityTolerar	DeepestPointDe	DeepestPointDe	DeepestPointHH	DeepestPointHH	DepthMM	DepthPercent	DepthPercent
Medium	Medium	139			0			630			28	
Medium	Medium	254			0			615			32	
Medium	Medium	268			0			645			28	
Medium	Medium	293			0			545			21	

Data source Metal Loss

Visualize

Uptime:



Questions