

Atmos Pig

Tracks pigs/scrapers in gas and liquid pipelines and accurately estimates their arrival times

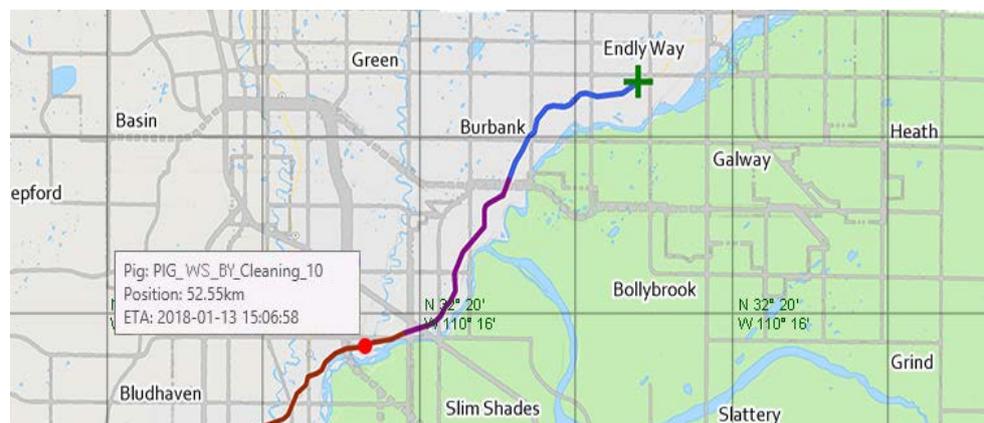
Intuitive user interface

Atmos Pig accurately tracks and displays every pig within a pipeline route in clear, visual displays with real-time updates on the position, velocity, and ETAs for upcoming stations or points-of-interest for every pig currently active in a pipeline, helping pipeline controllers optimize their operations and maximize productivity.

Pipeline controllers able to receive and hold a pig at an active pump station or terminal can use the 'Pig Parking' feature to track the 'holding' and 'release' of the pig without stopping the current operation until their nominations are met. When ready, the operator can stop the pumps and swing the corresponding valves to allow the pig to continue traveling through the station towards its final destination.

Features

- **Calculates real-time position**
- **Real-time estimated time of arrival**
- **Real-time tracking of multiple pigs per route**
- **Real-time velocity of pigs**
- **Pig parking**
- **Real-time volume in the segment upstream and downstream of the pig**
- **Real-time distance from launcher to all subsequent stations or points-of-interest**
- **Multiple pig route configurations for different valve alignments**
- **Unaffected by changes in pipeline conditions such as stoppage, restart, or reversal**
- **Works on bi-directional pipelines**
- **Learns the characteristics and velocity dynamics of each pig type for the current and subsequent runs**
- **Stores and tracks multiple pig types (smart, cleaning, spheres, separators, etc.)**
- **Historical archive of pig launches, passage detections, parking, receipts, and manual inputs/modifications**
- **Historical archive of user interaction**
- **Historical archive and reporting of pig velocity slippage factor for each run**
- **Arrival alarms configured for volume, distance, and time**
- **Upcoming pig launch alarms configured for time**
- **Detects and locates stuck pigs**



Pigs on a map

Atmos Pig continuously improves tracking to help optimize operations

Atmos Pig uses flow measurements to calculate the volume injected behind a pig. The system then applies various velocity slippage factors to estimate the distance the pig has traveled through the pipeline.

The system calculates the Estimated Time of Arrival (ETA) at various points along the pipeline based on the pig's current position and flow measurements. The system confirms and improves the accuracy of ETAs as a pig passes pig passage indicators and fine-tunes its learning parameters, assuring that ETAs are even more accurate on the downstream section of the current pig run and future pig-runs.

The intuitive operator-interface and dashboard present all relevant information on the current positions and ETAs of pigs traveling in the pipeline, so the operations team takes appropriate action as necessary upon receipt of arrival alarms. Alarms are set to preconfigured thresholds and can be updated by controllers in real-time as needed.

The operations team can access every report needed to compare and review the progress of current and past pig runs, and update the pig velocity slippage factors via the intuitive system dashboard if necessary.

The screenshot shows a software interface for pig tracking. At the top, there are navigation tabs: 'LX MAP', 'Overview', 'ENDW RT', 'PIPE VOLUMES', 'BATCH LIST', 'CONMS', 'PIG LIST', and 'PIG REPORT'. Below the tabs is a search and filter area with 'From' and 'To' date pickers, a 'Pig Name' input field, and a 'Search' button. Below this is a table with the following columns: 'Date and Time', 'Event Type', 'Route', 'Pig Name', 'Station', 'Old Pos (km)', 'New Pos (km)', 'Difference (km)', 'Pig Slippage', 'Effective Slippage', and 'Status'. The table contains 10 rows of data representing pig launch and passage events.

Date and Time	Event Type	Route	Pig Name	Station	Old Pos (km)	New Pos (km)	Difference (km)	Pig Slippage	Effective Slippage	Status
06 November 2017 04:49:47 PM	Pig Launched	PFS_WS_BV	PIS_BL_CB_Cleaning_18	WS_PLS						
07 November 2017 12:48:41 AM	Pig Passage	PFS_WS_BV	PIS_BL_CB_Cleaning_18	GM_PS	48.70 km	49.52 km	-0.83	1	0.981	
07 November 2017 08:06:22 AM	Pig Passage	PFS_WS_BV	PIS_BL_CB_Cleaning_18	CL_PS	98.16 km	99.40 km	-0.24	0.999	0.974	
07 November 2017 04:48:45 PM	Pig Passage	PFS_WS_BV	PIS_BL_CB_Cleaning_18	KM_PS	148.48 km	147.18 km	-0.7	0.996	0.974	
08 November 2017 12:29:36 AM	Pig Passage	PFS_WS_BV	PIS_BL_CB_Cleaning_18	NG_PS	197.25 km	198.00 km	-0.75	0.994	0.974	
08 November 2017 07:04:30 AM	Pig Passage	PFS_WS_BV	PIS_BL_CB_Cleaning_18	BV_P11301	227.63 km	228.75 km	-1.06	0.994	0.970	
08 November 2017 07:04:30 AM	Pig Received	PFS_WS_BV	PIS_BL_CB_Cleaning_18	BV_P11301						
08 November 2017 04:34:11 PM	Pig Launched	PFS_BL_CB	PIS_BL_CB_Cleaning_15	BL_PLS						
09 November 2017 11:03:25 AM	Pig Passage	PFS_BL_CB	PIS_BL_CB_Cleaning_15	CB_PT1001	822.45 km	822.95 km	-0.5	1	0.97	
09 November 2017 11:03:25 AM	Pig Received	PFS_BL_CB	PIS_BL_CB_Cleaning_15	CB_PT1001						

Pig Tracking report

Atmos Pig integrates seamlessly with Atmos Batch and Atmos LDS. Alternatively, Atmos Pig can send the information to any DCS or SCADA for presentation to the operations teams in dedicated screens.

Powered by Atmos SIM, the world's most modern, real-time transient model

Atmos Pig takes advantage of a real-time transient model to optimize its accuracy as operating conditions change. Atmos SIM's unique Maximum Likelihood State Estimator (MLSE) uses available flow and pressure data to provide a highly-accurate calculation of the hydraulics and composition of

products in a pipeline in real-time, while the Tuning Assistant keeps the model as close to reality as possible. Atmos Pig is a module of Atmos SIM and uses the same schematic as the pipeline model, Atmos SIM leak detection, and Atmos Batch.

Color	Pig Name	Pig Type	Pig Parking	Run Slippage	Effective Slippage	Distance (km)	Velocity	ETA	Distance to Receiver	Comment
	PTS_WS_BY - Wall St to Burry Pig Route Next pig name/type = /Cleaning									
	Launch									
	Edit	PTS_WS_BY_Cleaning_22	Cleaning	False	1	0.97657085817	52.28	1.90 m/s	2018-01-13 15:10:08	176.47 km
	PTS_BY_MC - Burry to Mace Pig Route Next pig name/type = /Cleaning									
	Launch									
	PTS_MC_DB - Mace to Derby Next pig name/type = /Cleaning									
	Launch									
	PTS_DB_SC - Derby to Schooling Next pig name/type = /Cleaning									
	Launch									
	PTS_SC_BL - Schooling to Ball Next pig name/type = /Cleaning									
	Launch									
	PTS_BL_CB - Ball to Cambel Next pig name/type = /Smart:									
	Launch									
	Edit	PTS_BL_CB_Smart_18	Smart	False	1	0.932264329238228	747.62	1.16 m/s	2018-01-13 07:20:25	75.33 km
	PTS_CB_RE - Cambel to Rice Next pig name/type = /Cleaning									
	Launch									
	PTS_RE_JT - Rice to Juan Terminal Next pig name/type = /Cleaning									
	Launch									
	PTS_JT_FR - Juan Terminal to Fury Next pig name/type = /Cleaning									
	Launch									
	PTS_FR_ED - Fury to Ender Next pig name/type = /Cleaning									
	Launch									
	PTS_WR_KT - Warry to Kent Next pig name/type = /Cleaning									
	Launch									

Station	ETA	Date and Time	Distance (km)	Volume (m3)
Launcher	Passed		-52.61	-14593.04
BV01	Passed	Passage confirmed	-32.71	-9119.63
BV02	Passed	Passage confirmed	-31.53	-8792.48
GM_PS	Passed	Passage confirmed	-3.09	-866.12
CL_PS	0d 0h 47m	2018-01-12 20:10:39	46.79	13103.60
HM_PS	0d 13h 43m	2018-01-13 03:06:59	94.67	25761.72
NO_PS	0d 19h 42m	2018-01-13 09:05:39	135.39	38066.65
BV03	0d 22h 13m	2018-01-13 11:37:01	152.65	42944.73
Receiver	1d 1h 39m	2018-01-13 15:03:01	176.14	49593.57

Pig route list

General Information

Network	BLU	
Pig Route	PTS_WS_BY	
Pig Name	PTS_WS_BY_Cleaning_22	<input type="button" value="Edit"/>
Pig Type	Cleaning	<input type="button" value="Edit"/>
Pig Parking	False	
Parking Location		
Run Slippage	1	<input type="button" value="Edit"/>
Effective Slippage	0.97657085817	
Current Position	52.61	<input type="button" value="Edit"/>
Current Section	PipeGM_PS1toCL	
Comment		

ETA:

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Pig run details

System outputs

- Pipeline pigging section
- Unique pig identifier
- Pig launch time
- Pig type
- Pig velocity
- Distance from the launcher
- Distance to receiver stations and any intermediate point, including those without instrumentation
- ETAs to receiver stations, and any intermediate point, including those without instrumentation
- Product volume between the launcher and the pig, the pig to the receiver, and the pig to any intermediate point, including those without instrumentation
- Arrival distance alarm
- Arrival time alarm

- Arrival volume alarm
- Scheduled/Upcoming pig launch time alarm
- Stuck pig alarm
- Stuck pig location
- Pig report in PDF, CSV, and Excel format

Sensors used

- Flow meters at inlet and outlet of the pipeline
- Pressure sensors along the pipeline
- Pig launch, receipt, and intermediate passage indicators (where available)
- Temperature sensors (optional)
- Density meters (optional)

Data source

- SCADA, DCS, PLC or RTU

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About Atmos International

Founded in 1995, Atmos International provides pipeline leak and theft detection, simulation technology, instrumentation and engineering services to the energy, water and associated industries. Atmos is the first choice of most pipeline companies worldwide, and is extensively used by major operators like Shell, BP, ExxonMobil, Petrobras, Enbridge and Total. With associated offices in the USA, China, Russia, Singapore, Indonesia, Colombia, Ecuador, Peru and Costa Rica, and local agents in 28 countries, our multi-cultural and multilingual team is dedicated to effective global support for the lifetime of our products all over the world.

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