



ITT

Engineered for life

Airborne Natural Gas Emission Lidar (ANGEL) Services

Operate with Greater Confidence through Enhanced Leak Surveys and Corridor Monitoring.

Utilizing a fixed wing Cessna to fly high above your pipeline right-of-way (ROW), ANGEL Services from ITT combines the most advanced leak detection methods with a high resolution digital mapping camera, and color digital video system with GPS coordinates – delivering the energy industry's most comprehensive end-to-end pipeline survey report.

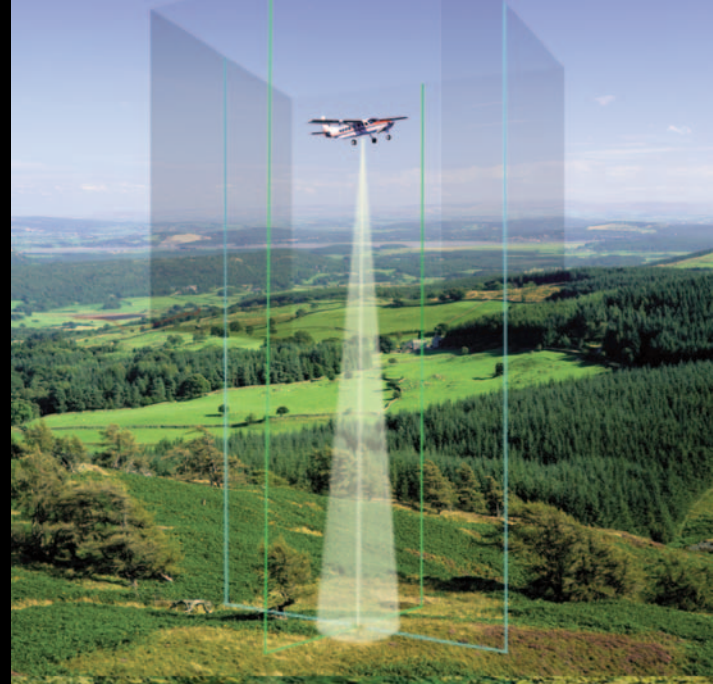
Communications • Sensing & Surveillance • Space • Advanced Engineering & Integrated Services





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ITT's ANGEL Services combines the speed, efficiency and practicality of an aerial patrol with the confidence and accuracy of verifiable data. ANGEL Services is the ideal way to fully inspect your right-of-way while simultaneously verifying your pipeline's condition.



And with guaranteed greater than 99% pipeline center coverage, you can rest assured your above or under ground transmission lines, gathering fields and stations will be thoroughly surveyed without the gaps in coverage found with conventional methods.

COMPREHENSIVE AND PRODUCTIVE

- Survey up to 1,000 miles per day — more than 100 times faster than conventional methods.
- Expanded coverage of your ROW. A 100 foot wide swath (versus 4-5 ft for hand held) ensures all emissions – even migrating ones are detected.
- Virtually eliminates all accessibility issues such as terrain conditions and property access.

ACCURATE

- Utilizing GPS data and a computer-controlled optical scanning system, the sensor automatically accounts for plane position and orientation.
- Unmatched precision. ANGEL Services captures data and mapping to within 10 feet (3 meters).
- Utilizing field-tested algorithms, ANGEL Services eliminates false alarms by accounting for background hydrocarbon levels.

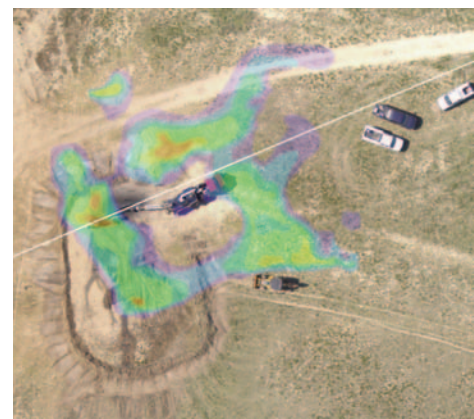
COST EFFECTIVE

- Eliminates the need for operations to make capital purchases
- As an outsourced service, direct and indirect operating cost savings can be achieved
- Better utilize your personnel – shift from finding emissions to managing them

MEETS REGULATORY REQUIREMENTS

- Co-developed and funded by Department of Transportation and other U.S. Government agencies
- Certified findings help meet regulatory requirements
- Fully ISO 9001 and ISO 14001 certified operation
- U.S. DOT and EPA Natural Gas STAR compliant reporting

Combining leak survey data with high resolution imagery enables more timely and effective decisions.



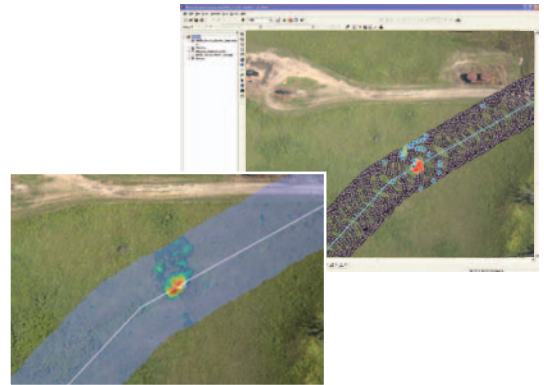
The modern aircraft, avionics, and data processing equipment is operated by one of the most experienced teams of remote sensing experts in the world. Technology suppliers and partners include Cessna, ESRI, BAE, NavCom, and Applanix.

ITT's ANGEL Services is a comprehensive, turnkey solution. Operated by certified professionals, the service precisely detects potential pipeline failure points and provides you with a comprehensive end-to-end pipeline summary.

ANGEL Services deliverables include:

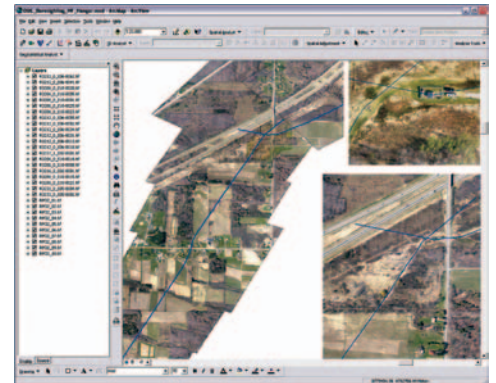
Leak Survey Report and GIS Datasets **Precisely locates and quantifies your natural gas leaks**

- Precisely identifies the presence of gas emissions within your ROW for enhanced safety and reliability in your operation
- Inspect 30 times more ROW width at 100 times the survey speed as conventional walking methods
- Quickly identifies and graphically represents emissions concentration for service prioritization and dispatch
- Improves record keeping, allows you to build historical datasets, and comparable year to year survey results



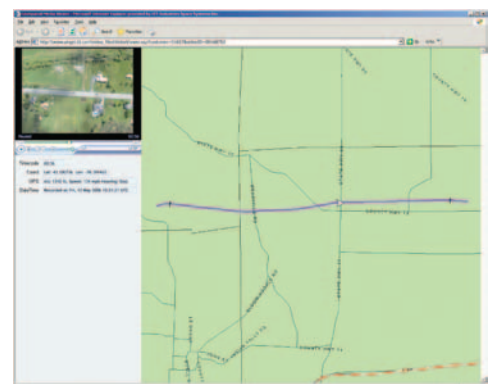
Orthomosaic Mapping Imagery **Easily check High Consequence Areas and encroachments**

- Delivers current, high resolution imagery of your ROW and surrounding areas
- Update your digital GIS system with color, one-foot ground resolution, orthorectified and mosaic imagery
- Supports alignment sheets, HCA identification, threat identification, site permitting, engineering, and emergency planning



Color Digital Video with GPS Coordinates **Conveniently patrol the ROW corridor and surrounding areas from your computer**

- Provides permanent record of aerial patrolling, easement conditions, encroachment monitoring, intrusion detection, and problem areas
- Encodes video data with precise GPS information so exact locations can be identified
- Play, pause, fast forward, and rewind digital video and
- Print video frame captures from digital video
- Reference areas of concern for before/after record keeping



Your new Best Practice for Natural Gas Leak Detection is here.

To learn more visit www.ssd.itt.com/angel
or call us at 585.269.5121



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