

## Computer Based Geographical Data and Audit System



Advanced Engineering Solutions Ltd are pipeline engineers, providing services in a wide range of technologies for the water, gas and oil industries. A particular specialisation is in pipeline management for the water and gas industries, including inspection, condition assessment, maintenance and asset management strategies.

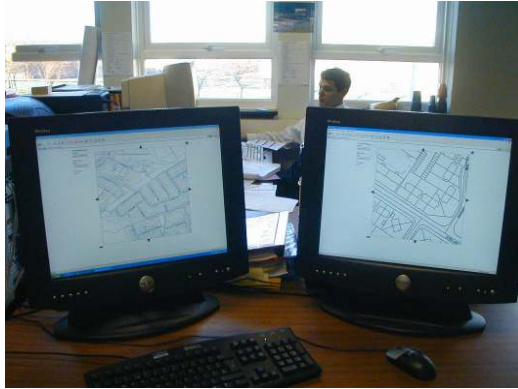


A major issue when working on utility pipelines is their wide geographical spread, covering the full range of urban and rural locations. In common with other companies operating on these pipelines this makes the management of field teams, identification of appropriate project locations and accurate record keeping very problematic. These issues have been the basic drivers to the development of a map based communication system between field projects and the office.

A particular requirement has been the need to rapidly transfer pipeline inspection data between the field teams and the office and to return information as required. This approach allows the office based engineer to confirm the quality of the inspection outputs and, where necessary provide instructions for further inspections to ensure a statistically valid output.

The solution has been to develop in-house, a map based communications system with immediate bi-directional communications between the teams and the office. The outline specification for the system is as follows:

- Central mapping system with a small-dedicated server and twin large computer screens to allow office based access to data on-going and historical projects. Each type of project as a specific icon appearing on the screen and the twin screens allow map and photographs or data be analysed simultaneously.



Twin Screens

- Field teams who are equipped with PDA, hand held computers which allow:
  - Control of inspection tools via a blue tooth communication system
  - Recording of field data by direct manual input on the PDA
  - Confirmation that all data is collected using appropriate input 'fields' in the software
  - Transfer of the data via a Blue tooth equipped phone and direct transmission to the AES office, mapping system



Tool Outputs

- Vans and inspection tools fitted with GPS receivers to allow automatic location of each project. The GPS data is the first input to the project system on the PDA. The GPS positional data is the core of the audit trail and locates the project on the computer maps.
- Blue tooth equipped cameras allowing direct transfer of site photographs from the field team to the office. The file location of the received photographs is again based on the GPS positional data.
- The mapping system is available on a website, allowing access by customers who are provided with appropriate passwords. Identification of the appropriate icon allows the customer to interrogate their ongoing and historical projects.

- The GPS system and mapping data also allows accurate identification of appropriate work sites for the team. The team can be guided to the appropriate location based upon an engineer's prior identification of the site.

The system has increased productivity significantly. However it has also provided a very effective audit trail recording accurately the location of each individual project and ensuring that the necessary data is recorded.

A further development of the system has been to have all customers pipeline maps installed on a server and have this information accessed from the field based PDA via the Blue tooth phone. This allows the field teams to identify specific failures, valves it's using the GPS feature in the PDA.

The software allows the maps to be shown on PDA screens, identifying the location of the operator and pipeline features. Changes to the site data can be input to the PDA including, if necessary, sketches and the data transmitted to the office for actioning.

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The system can be easily tailor-made to suit other applications such as the mapping of housing stock, street furniture, street works etc. with the rapid exchange of data between the site and office. It allows updating of the maps on-site and accurate positioning of features via the GP system. The PDA input screens or 'forms' for use by personnel on site can be designed and tailored to suit any requirement.

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