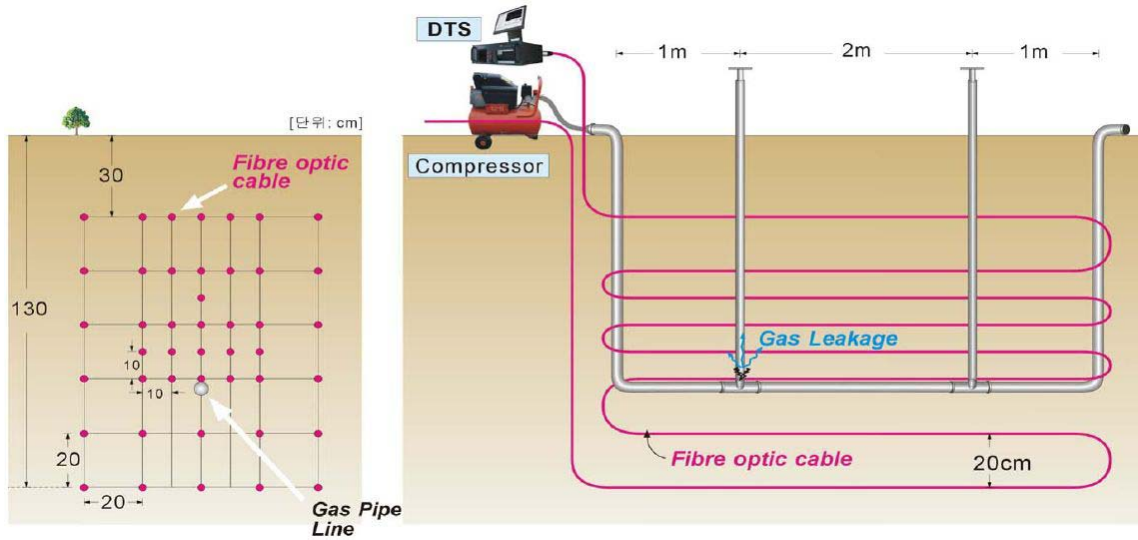
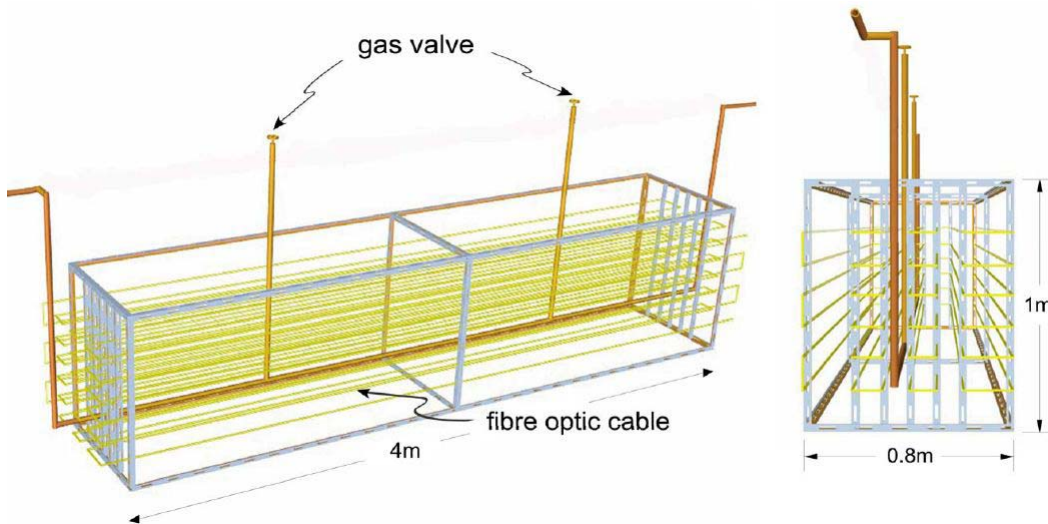


## Sensornet Gas Pipeline Leak Detection

This test was carried out in Q2 2006 for the Korean National Gas authority in conjunction with Sensornet's Korean partner company [SOAM Consultants Co.](#) The aim of this project was to detect leaks in a gas pipeline using compressed air using the Sentinel DTS. Note with compressed air temperature changes are very small ( $2^{\circ}\text{C}$  from ambient conditions). The setup of the system was as shown in the following two images:



Installation map of DTS cable for the gas leakage detection test



Custom-made structure for installation of DTS cable around gas pipeline

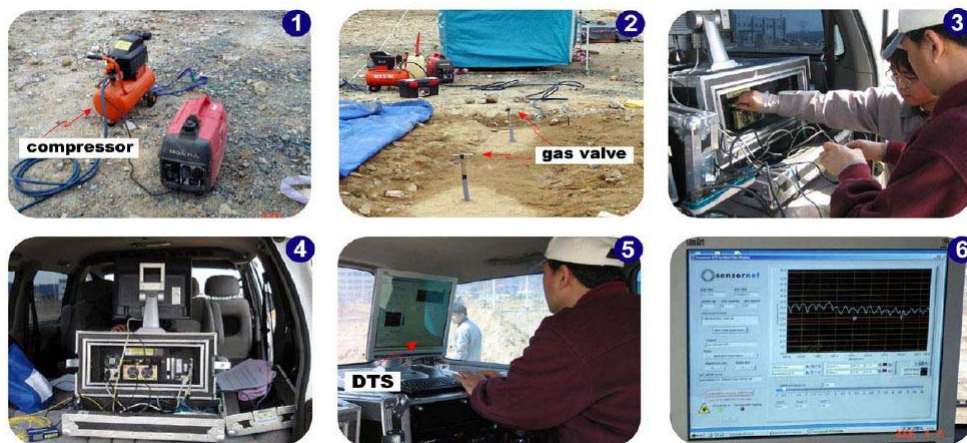
## Summary of test procedure

- A Sensornet Sentinel DTS system was used to monitor the temperature thermal response of the system due to gas expansion as a result of a leak occurrence
- Compressed air was used as the gas contained in the pipeline. As the compressed leaks from the pipeline it cools on expansion – but only by a small amount (2°C)
- A section of pipeline with fibre optic cable installed in close proximity to the pipeline was buried underground. The pipeline contained valves to enable simulation of a leak event – by opening the valve a gas leakage could be created.
- The fibre optic cable was installed as close together as possible to the pipeline to accurately detect a result, using a frame to tie the cable to for easy installation.
- A leak was created by opening a valve (by use of a handle extension to the valve) in the buried pipeline.

The installation procedure is shown in the following diagrams:

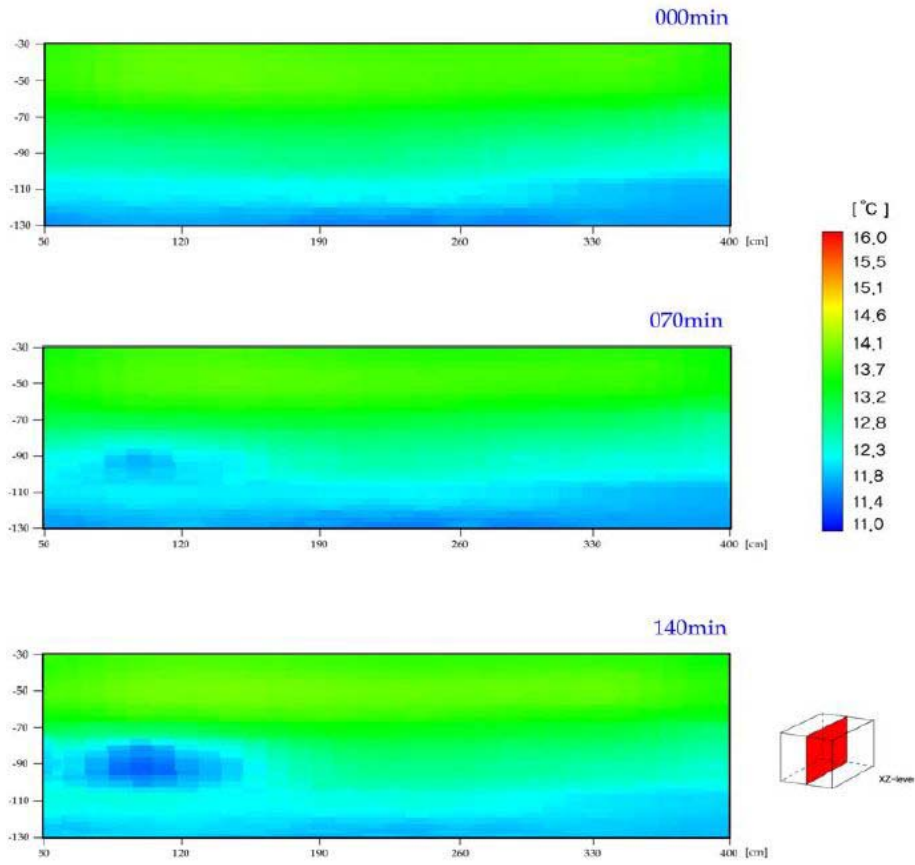


Installation procedure at the testing site

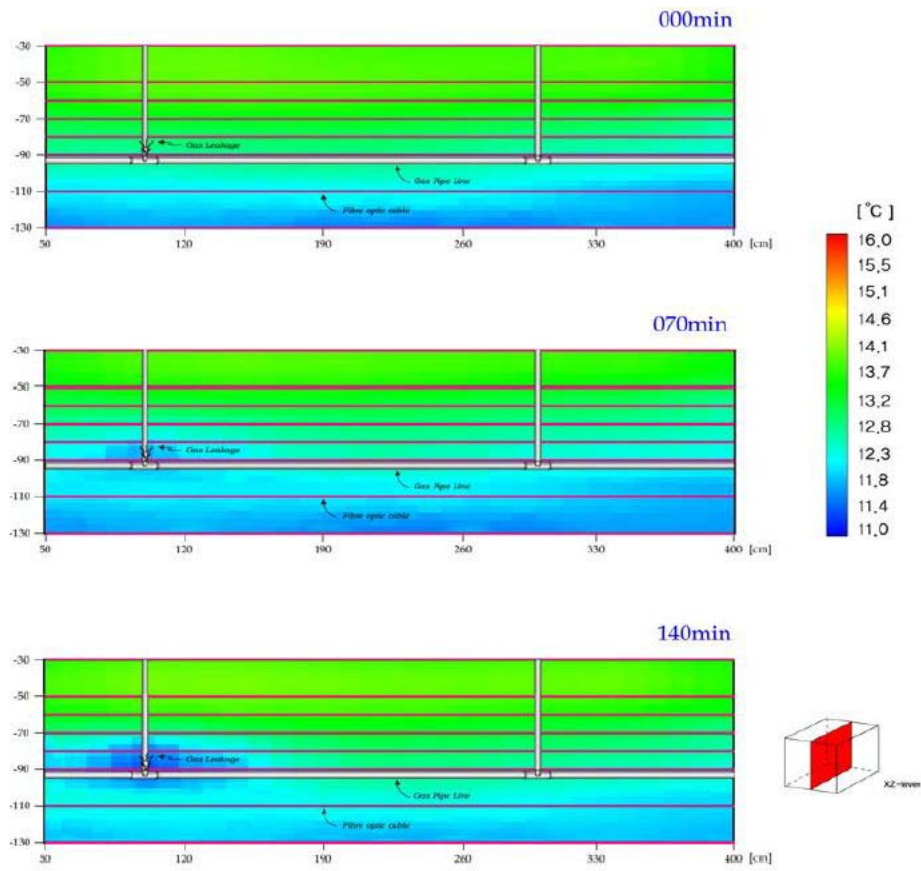


Simulation by injecting compressed air into gas pipeline for monitoring temperature change

## Results



Temperature change of the gas pipeline under its leakage along with time pass at vertical view (120 l/min)



Temperature change of the gas pipeline under its leakage with time. Leakage position is displayed as above.

## Conclusion

The Sentinel DTS effectively detects leaks using only very small temperature changes occurring due to expansion of gas causing a temperature drop (of approximately 2°C) in the surrounding environment (an area 40cm x 100cm) of over a period of approximately one hour.

Please contact a [SensorNet](#) representative or SOAM [Consultants Co. Ltd](#) for more information.