

# Ammonia Pipeline Monitoring

## France

Ammonia is highly toxic and needs to be carefully monitored when transported as a highly cooled liquid through pipelines. AP Sensing's fiber optic-based Distributed Temperature Sensing (DTS) system was selected to monitor an entire network of ammonia pipelines at an animal food supplement plant.

Ajinomoto Animal Nutrition Europe is a leading producer of feed-use amino acids. One of its production sites is located in northern France, where the company receives deliveries of liquid ammonia via train tanks.

A distribution pipeline network is used at the processing plant to transport the ammonia. Some of challenges encountered with this include the large number of 3D bends throughout the network, and variations in the pipe diameter between two and four inches. To monitor all pipelines on the plant, a two-channel AP Sensing DTS interrogator is in use, providing fast leak detection.



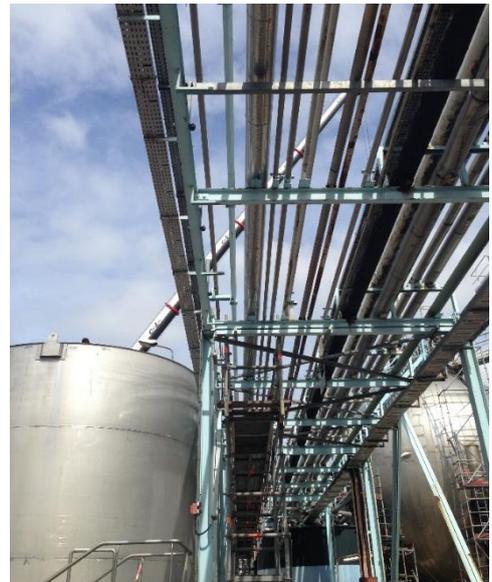
*Left: Ammonia pipeline area*

*Right: Production site in northern France; ammonia sphere on the right*

A sensor cable with flexible metal inner and outer tubing was selected because of its optimal protection and strength, as well as its fast thermal response and appropriate operating temperature range. The fiber was retrofitted to the bottom of the insulated pipes and placed outside the insulation. Approximately 1,200 m of sensor cable was deployed altogether.

The AP Sensing DTS installation is designed to detect any cold spot that would occur if ammonia leaked anywhere along the pipeline. Liquid ammonia in a pipeline quickly expands as it turns into gas, quickly lowering the temperature. In case of an alarm condition along the pipeline, valves are closed before and after the leak location to quickly shut off the flow of ammonia. This limits the amount leaked into the environment in the event of an accident.

The installation was carried out with AP Sensing's global partner TopSide, providing valuable experience for fiber retro-fitting, installation planning and execution, splicing, and cable routing. DTS alarms are communicated to the plant's control system via the internal Modbus TCP interface, and no additional PC is required. A valuable and potentially risky infrastructure is securely and efficiently monitored for maximum protection.



*Left: Sensor cable wrapped around a flange for improved leakage detection  
Right: the "pipe rack" on the campus*

