Odors Gases Particles Liquids Noises

CUSTOMER CASE

Paper Packaging Company (North America)

Real-time identification and quantification of odors for operational and compliance objectives

ellona

Customer Needs

The client is located in a suburban area of a large city, surrounded by other industrial operations.

Multiple paper converting processes are carried out in the production plant, which produce intense and overlapping odorous emissions.

The city council has repeatedly and increasingly communicated the need for effective odor control to avoid the need to relocate the plant.

In addition, the client needs to optimize its current mitigation/remediation processes to reduce its costs in additives (Biofilters) and energy (Fogging Ramp).

Odor mitigation relies heavily on the ability to identify odor sources and differentiate them from nearby off-site sources. Given the complex topography and architecture of the site (nearby elevated railroad, highways, dense group of own and external channeled sources), the real-time identification and quantification is key to any mitigation/ remediation endeavor.

Once the offending source is differentiated and identified the plant operator will be able to take immediate corrective actions.

Figure 1: Paper Factory

Customer solution

The implementation of an Ellona WT1 Analyzers network, consisting of 3 WT1 units each with H2S, Mercaptans and 4 four different Metal-Oxide (MOX) sensors units.

WT1

This solution was selected by customer, as contrary to most competitors in the market, Ellona has developed a unique expertise in MOS sensors. These sensors are key in accurately measuring odor intensity and quality as H2S, Mercaptans, RSH, and NH3 sensors alone are not capable of accurately representing odor complexity.

Customer setup

The integration of the data from the Ellona Intelligent Platform into the Plant's dashboard and control panel was made available through the built-in API.

Since the customer location was exposed to multiple contributing sources, a preliminary study was conducted with the help of our local partner. This helped to determine the optimal locations for the WT1's based on in-situ observations, the data provided by an initially deployed unit, and prevailing winds directions.

Figure 2: Implantation of WT1 units

Main results:

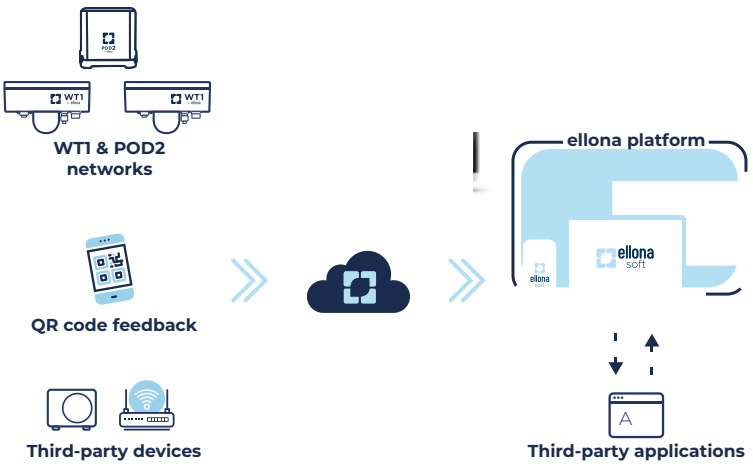
1. Odor levels automatic identification (real-time)

2. Characterization of Perceived odors – Three repetitive sources were characterized (Pungent, Rotten Egg and Wet Paper odors)

3. Identification of emitting sources - Based on the odor characterization and the events log the three perceived odors were mapped back to specific sources (two internal and one external to the property)

4. Triggering of alerts and alarms for remediation purposes - notification thresholds were defined at 500, 750 and 1,000 Distance Odor Units (DOU)

5. Odor level data was collected for correlation analysis with operational activities (Biofilter additives and Fogging ramp). The optimal utilization of additives and the ramp was translated into chemical and energy savings.



A model was built (figure x), mapping Odor intensity (expressed in Odor Distance Units - ODU), characterizing different odor sources and correlating with the H2S and Mercaptans levels.

These baseline variations plus source characterization allowed the plant operator to an effective way to identify the contributing source, activate alarms and notifications, to quickly implement mitigation/remediation actions and to map with plant operations.

Response was always calibrated to the specific need optimizing the operational expenses avoiding unnecessary expense of additives and energy.

Knowing the impact of specific operations on the actual emission of odors enabled the customer to review some of the specific activities and implement preventive changes.

The WT1 and the associated model were able to distinguish between the various odor sources, displaying unique digital fingerprints), thus leading the path to online odor identification.

Components of the Ellona solution for odors

COMPONENT A

NETWORK OF ENVIRONMENTAL ANALYZERS

Hardware: WT1 (Watch Tower 1) *Analyzer*
Software: *EllonaSoft*
API: *Ellona API Rest*
Survey Tool: Sensory perception surveys

COMPONENT B

ODORS' RELATIVE QUANTIFICATION

To measure odor intensity, Ellona devices can be trained with the Ellona Distance-OU proprietary methodology. This methodology allows you to easily and rapidly set alarms related to customer defined Odor/Total VOC thresholds.

COMPONENT C

ODOR INTENSITY STANDARD ASSESSMENT

The solution can assess the absolute odor intensity and express it in OU/m3 as described in the Norms ASTM E679 and EN 13725. This capability relies on the "training" of our analysers with a known dynamic olfactometric data set.

COMPONENT D

ODOR QUALITY & SOURCES IDENTIFICATION

Sources Fingerprinting is the capability of graphically representing a given odor or event. Thru this technique a source specific graphic is built. This allows to clearly differentiate sources. A given data point can be mapped back into the fingerprint and thus allow to identify its origin.

COMPONENT E

ODOR DISPERSION ANALYSIS AND FORECAST

Based on the gaussian plume model recommended by the US EPA, AERMOD, the dispersion software is a powerful tool for digital simulation of the dispersion of odors and / or polluting gases. The system integrates local weather, emissions of sources of odors, topography and concentrations of odor and / or polluting gases measured by the various sources analyzers WT 1, to dynamically model the plume.

COMPONENT F

SAMPLING

The WT1 analyzers can act as a reliable sample "triggering" device, when a threshold of a measured event is reached. The WT1 Analyzer will identify the selected threshold being surpassed and automatically trigger a sampling action like with the utilization of bags. The unit includes a 4-20mA standard connector that can be used to connect with the sampling unit.

COMPONENT G

STATISTICAL TOOLS AND SERVICES

Ellonasoft provides multiple advanced statistical tools and pre-built calculus models that can answer many of the more relevant business information needs. The service produces reports that are central for the mitigation/ remediation and prevention. A monthly recurring service can be provided upon request. The development of experimental plans and specific data processing can also be addressed thru a dedicated consulting team.

Notes

We empower people with environmental intelligence

For full results and customer testimony please contact us at www.ellona.io

About ELLONA

Our mission is to make the invisible visible, by measuring in real time gases, particles, but also noise, light or vibration, and by providing this data to citizens, employees and customers (the 3Cs). But our challenge is above all to make these data actionable in order to allow to remedy in real time these different nuisances and pollution, and to make the concerned spaces healthier and safer.

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