



Alert Plus, Inc.

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Intellergy 2016 Case Study



Study

In 2016, Intellergy in partnership with UC Berkeley's Global Campus installed an engineering plant of its gas-to-liquids (GTL) system for the purpose of converting different feedstock into different drop-in fuels. Intellergy's drop-in (*ready to use*) fuels include Diesel #1 and #2, Jet-A, Milspec JP-8, and kerosene as well as hydrogen. Ultimately UC Berkeley intends large-scale production of hydrogen on campus from municipal-solid-waste (MSW) so that the campus may be fully autonomous in its waste removal and fuel production using the hydrogen in vehicles and in on-site electrical generation.

Intellergy's engineering installation was in the context of converting natural gas from a Pacific Gas and Electric Company (PG&E) residential gas line feeding the Berkeley building being used by Intellergy. Intellergy's patented and confidential system converts methane (CH_4) through a high heat steam-reforming process into syngas prior to final conversion to different Fischer-Tropsch drop-in fuels. Syngas is primarily hydrogen (H_2) and is well known to be lighter than air and extremely explosive. Furthermore, California has possibly some of the strictest air quality standards in the United States and the entire Intellergy project at UC Berkeley needed to meet the Bay Area Air Quality Management District (BAAQMD) regulations in order to successfully operate.

The challenge was therefore an instrument capable of precisely monitoring multiple gases to the satisfaction of one the most exacting air quality districts in the world while providing real-time protection to staff within a confined space. Intellergy is using natural gas from a PG&E residential gas line composed of 98.7% CH_4 , 0.5% N_2 , 0.8% CO_2 , and less than 1 ppmv of Sulfur by volume. The primary by-product prior to the Fischer-Tropsch synthesis is hydrogen. The BAAQMD stipulated that among emission limits, Sulfur and Carbon Monoxide were not to exceed 3.4lbs and 3,642 lbs respectively per year and that Intellergy would maintain monthly records ensuring compliance with emission limits. At the same time, Intellergy wanted a monitor that would also provide real-time detection to protect the staff in the process of its conversion.

The solution was the onsite installation of the Aegis 400 which was installed by Intellergy's own staff within a couple of hours. The system included RKI Instruments sensors for Carbon Monoxide (CO) sensor (25-100 ppm), Hydrogen (0-100%), Methane as LEL (0-100%), Hydrogen Sulfide (1-100 ppm). The Aegis

The Context

Experimentation of an engineering unit converting residential methane into hydrogen and other drop-in fuels within a confined space under strict BAAQMD regulations.

The Challenge

Precisely monitor and log multiple gases to ensure compliance to emission limits placed by one the most exacting air quality districts while providing real-time protection to staff.

The Solution

Implementation of the Aegis 400 with elevated sensors for lighter than air gases and data logging for oversight.

The Results

Unit successfully installed and has increased BAAQMD greater confidence in project meetings air quality standards.

system was placed in an open area next to the steam reformer with sensors elevated to catch the lighter than air gases that rise as exhaust. The placement also afforded a clear view of the visual alarm in case conditions merited an alarm. Both the real-time monitoring and the visual and audible alarm provide instantaneous warning to staff onsite if conditions met the alarm criteria as defined by Dr. Galloway and BAAQMD.

Dr. Galloway and his staff are pleased with the results and have already had the Aegis alarm in the instance of elevated carbon monoxide levels due to heavy equipment in the lab. The Aegis helped Intellergy's application for its air quality permit with the BAAQMD providing full-time monitoring and data logging.

If there are further questions specific to this summary, please contact:

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Photos



UC Berkeley's Global Campus in
Richmond, CA



Intellergy's Engineering GTL Plant at UC Berkeley



Dr. Terry Galloway
installing part on
steam-reformer



Dr. Galloway and hydrogen car of the
California Cars Initiative



Aegis 400's sensors
elevated to monitor
rising gases.