



Varec Biogas

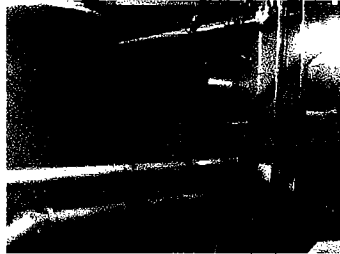
A Division of Westech Industrial Inc.
291 Cheshaven Road, Earleville, MD 21919
Phone: (410) 275-1650, Fax: (410) 275-1650

Service Report Veolia water LLC Schenectady NY. WWTP

Attention: Paul La Fond, Monica Blount
Tel: 518-631-0037 X3002
Visit dates: 17 January, 2008
Subject: Site survey and repair.

Thank you for the opportunity to visit your site. The following report will cover our findings and recommendations to improve / update your existing biogas safety system.

We arrived on site and met up with your technicians Mat, Lou, and Dave who accompanied us to the boiler control room where boiler equipment and piping installation was reviewed.

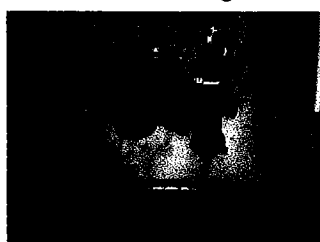


The dual fuel natural gas / biogas boiler temperature is unable to exceed 110 degrees (F) while operating on biogas. This low temperature is making it difficult to maintain proper 98 degree digester operating temperatures necessary for optimal methane production. Also, supply pressure at the boiler inlet deviated from six inches water column while not running to only 2 inches of water column while running on biogas.

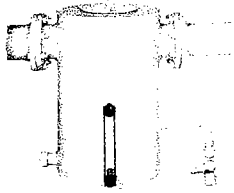
We continued on to the lower gas piping room where we were joined by Monica Blount and Paul La Fond who then accompanied us to the waste gas burner and the four (4) digesters on your site. One of the digesters is out of service; the other is used as a sludge storage tank with the two remaining digesters still in service. During our visit Monica was able to analyze and provide us with your sites methane content of 65% which is sufficient for boiler utilization.

Lower Gas handling room:

The boiler is fed from the digesters through outdated PFT regulators and a PFT flame arrester which is contributing to the restricted low volume of biogas delivery to the boiler. The equipment was Non-functional in its present state, so by removing the internals we were able to decrease the pressure drop and increase the volume of biogas flowing to the boiler.

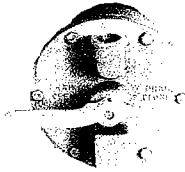


Per MOP 8 and in order to remove solids and liquids from the biogas stream as it exits the digester in route to the boiler, we recommend the installation of the Varec Biogas model 233 condensate sediment trap with sight glass and manual operated drip trap.



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Some of the gas piping in the lower gas handling room will need to be reconfigured in order to accommodate the condensate sediment trap. Also recommend is additional Varec Biogas model 246 low pressure manual drip traps.

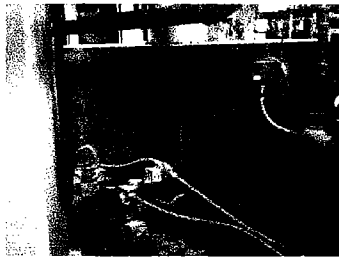


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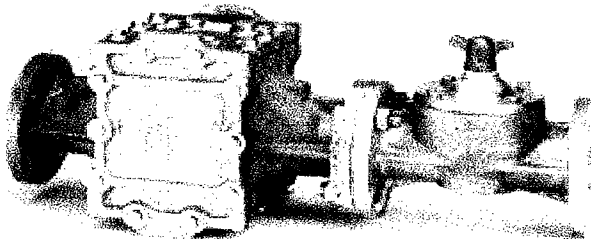
The drip traps should be installed @ all locations where you presently have active ball valve drains.

Boiler room:

The original flame arrester location in relation to the boiler is ineffective and a new flame arrester would have to be located in a more practical location within 15 feet of the boiler. The 3" pipe above the boiler would be an ideal location for this application.



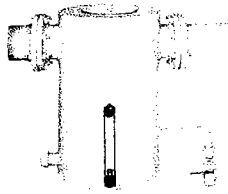
Here we recommend the installation of the Varec Biogas model 450, 3" flame trap assembly.



450

The assembly includes both the Varec Biogas 5000 series flame trap and model 430 thermal operated shut off valve. The combination of the two components is highly recommended for safe handling of biogas flowing to the boiler.

We recommend the installation of a second Varec Biogas model 233 condensate sediment trap with sight glass and manual operated drip trap across the room from the boiler within the new 4" piping.

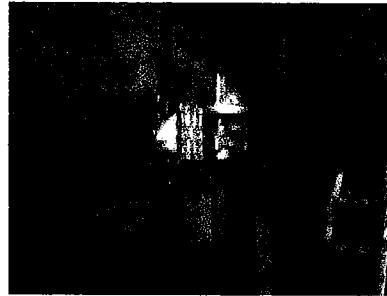
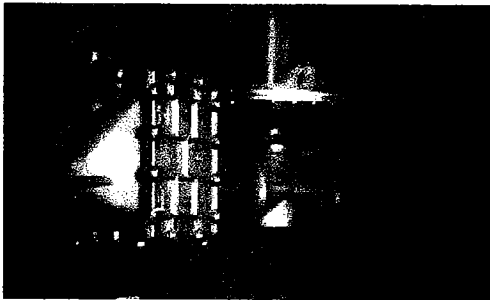


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Upper gas handling room:

Installed here is the Varec Biogas model 440 back pressure regulator and flame trap assembly. Understanding this equipment to be twelve years old yet having never been serviced we elected to disassemble, inspect and clean both the flame arrester and valve.

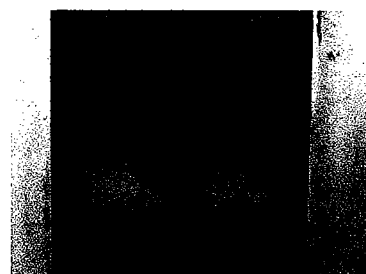
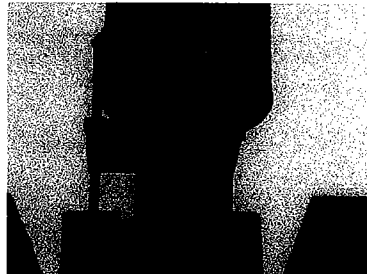
With the help of your technicians we were eventually able to remove the flame bank assembly from the flame arrester casing. The flame bank assembly was partially cleaned then reinstalled however it does need to be replaced as soon as possible to ensure proper operation.



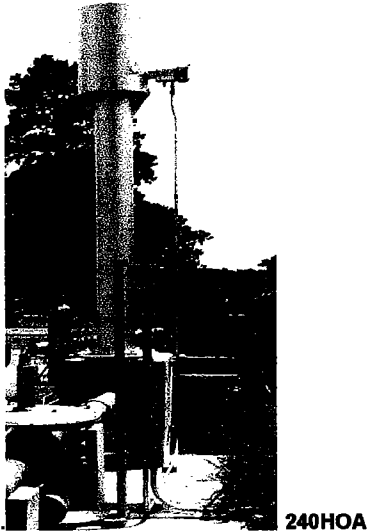
We removed, cleaned, inspected and reinstalled the back pressure regulator, thermal bypass valve, and regulator cap. The regulator cap has not been installed since the valves installation and without it the thermal bypass valve can not function properly. The regulator was recalibrated to seven (7) inches of water column. Both the regulator and flame trap assembly will require future routine maintenance in order to ensure optimal performance and efficiency of your system.

Waste gas burner:

The elevated PFT candle stick flare is rusted, corroded, and in poor shape. The ignition is manual light only (Stick & Rag) and utilizes biogas for pilot. The pilot would not stay light while we were on site.

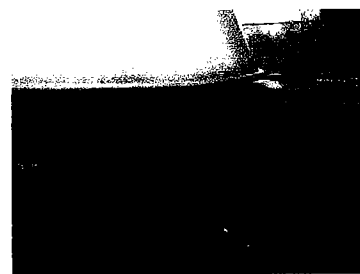
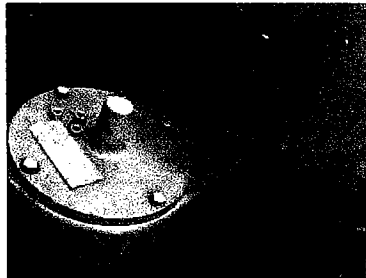


We at Varec Biogas offer a variety of waste gas burners however the one that most closely resembles your existing equipment is the Varec Biogas 239 with 240 HOA. This is a waste gas burner with automatic cycling ignition system. This flare provides electronic ignition by means of a spark rod automatically or manually initiated at a remote control panel and ensures continuous operation even during inclement weather.

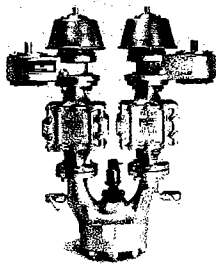


Digesters:

As previously mentioned there are two active anaerobic digesters at your facility able to produce usable biogas. The Varec Biogas four (4) inch pressure vacuum relief valves atop these digesters were in need of maintenance and both were directly mounted to the digester with no flame arresting capabilities in place. We disassembled and cleaned the pressure and vacuum relief valves and seats and installed new Teflon inserts, and reassembled all components.



The pressure relief pallets should be replaced as they were out of shape and unable to provide an adequate seal to the seat. We also highly recommend the 2011 "All Weather" PVR valves be installed with the Varec Biogas 5000 series flame arresters and add insulating blankets to the entire assemblies. The flame arrester prevents the propagation of flame or flame flash back and the insulating blankets protect from ice and snow during winter months.



Safety Selector Valve with duel 5811's

Another recommended option is to install the Safety Selector valve and two pressure and vacuum relief valve with flame arrester assemblies to ensure that the digester is protected at all times. Because these valves and flame arresters require ongoing maintenance the Safety Selector valve would provide a means to isolate one set of equipment while safely performing maintenance functions on the other.

With all components of your system reinstalled and secure we opened all isolation valves and restored biogas flow throughout the gas piping network. Lou lit the flare, we made some final adjustments and recorded boiler / service, digesters, and flare manometer pressures to be at seven inches water column.

With the pressures stable the boiler was put back in service and a considerable improvement in temperature increase was noticed. The previous maximum obtainable boiler temperature was 110 degrees (F) and by the time of our departure this temperature had already been exceeded.

We had a brief exit meeting with Paul La Fond and discussed our findings and recommendations and the various work we performed on your equipment while on site.

If we can be of further assistance please contact us.

Thank you,

Sincerely,

Scott A. Milloway

Scott A. Milloway.
Sr. Field Service Engineer
Varec Biogas

From: Chris Burde [cburde@verizon.net]
Sent: Wednesday, February 20, 2008 11:36 AM
To: LaFond, Paul
Subject: Schenectady NY ---Varec Gas safety and Flare
Paul,

We would be pleased to furnish and deliver the following Varec equipment in accordance with Scott Milloway's field inspection report.

Model 233 Galvanized Steel -6 inch Flanged Condensate tank, with site glass and 246 manual drip trap—basement Location---\$5,557.00 each

Please confirm 6 inch piping

Model 233 galvanized steel 4 inch Flanged Condensate Tank with sight glass and 246 manual drip trap—across room from boiler---\$4,933.00 each

Model 246 manual Drip Trap----\$1,017.00 Each

These units should be installed at ALL Low points of gas piping and replace the active ball valve drains—please advise on quantity required

Model 450 Flame Trap Assembly size 3 inch, horizontal ,all aluminum construction—directly above boiler ---\$3,207.00 each

Spare Bank Assembly for existing 440 located in upper gas handling room—\$1,176.00 each

Model 5811B pressure relief valve with flame arresters size 4 inch -location digester roof-quantity 4--\$3,448 each x4 = \$13,792

Add for 4 insulating jackets----\$2,621.00 each x4 =\$10,484.00

Model SSV—Safety Selector valves,4 inch—location digester roof-quantity 2-\$9793.00 eachx2=\$19,586

Add for 4 inch insulating jackets --\$2,634.00 each x2 =\$5,268.00

Model 239 Flare 4 inch with 240 H-O-A in Nema 4x 316 SS enclosure---\$21,930.00

Service—installation inspection, check out, start up, instruction-----\$6,000.00

Drawings -----4 weeks

Fabrication---8-10 weeks

Freight---FOB Factory, Prepaid to Jobsite

Terms---100% Net 30 Days

If you have any questions please feel free to contact me

Chris Burde
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email-cburde@gafleet.com