Camden Council Bio-Diesel Trial – Executive Summary

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Gilbarco Fuel Dispensers can be manufactured and/or modified for use to dispense various Biodiesel and Biodiesel/Petro Diesel blends.

Introduction:

In July 2003 Gilbarco was approached by the Camden City Council to participate in a 6-month trial they were planning to conduct in conjunction with the Australian Biodiesel Consultancy group and with the support of limited funding from the NSW State Government Environmental Protection Agency (EPA). Meetings were held with the projects consultants and other interested parties and Gilbarco agreed to supply a "Fleetline" model Industrial pump and participate in the trial of a 100% Biodiesel fuel.

At the time of this request to participate in the trial Gilbarco also responded to the Commonwealth Department of Environment and Heritage with comment on the then Proposed Biodiesel Fuel Quality Standard - Discussion Paper 6. Subsequently an Australian Standard for Biodiesel Fuel Quality has been specified and issued.

Trial:

The trial was conducted in the Camden Council area using two garbage trucks, one running on Biodiesel and the other using conventional low sulphur diesel. Other parties were involved in inspecting and servicing the trucks and monitoring their performance, which included fuel economy and exhaust emission testing.

Gilbarco's participation in the trial consisted of the following:

a) Supply and installation of a reconditioned Fleetline pump and new Tokheim Model 52 Pressure Regulating Valve to an above ground (AG) tank and platform stand that was supplied and installed by others. The AG tank was installed at the Camden Council yard at Narellan.

b) Perform initial commissioning and calibration check/adjustment.

c) Perform periodic calibration, performance and leak checks. Initially performed on a weekly basis, then fortnightly and when stable, monthly.

d) Report the results of each check to all interested parties.

e) Conduct fuel compatibility testing of typical seals, diaphragms and gaskets used in Gilbarco pumps and ancillary equipment and report to all interested parties.

f) Receive copies of performance reports and fuel analysis testing being done by others.

g) At the completion of the trial, around mid April 2004:

- Strip down and inspect the pump and meter of the Fleetline pump.
- Remove the Fleetline if Camden Council decides not to purchase.

Summary of findings:

- Fuel quality can vary from one batch to another with gel point variations dependent of feedstock and/or blends of tallow and vegetable oil based fuel. Gelling of fuel clogs strainers and filters and inhibits correct operation of the fuel delivery system.
- Calibration can be effected by variations in fuel density and viscosity.
- Other than gelling issues in cold temperatures, the Fleetline pump performed as it would with petroleum diesel (Fossil Diesel).
- Fuel compatibility testing showed that:
    - Seals and gaskets made of Nitrile compounds will swell and loose strength and therefore may require replacement if components are dismantled and reassembled.
    - Diaphragms and Check Valve poppet seals made of Nitrile compounds are affected to varying degrees and may require replacement with diaphragms and seals made from a suitable material, such as Viton.
    - Delivery hoses designed for use with Biodiesel are required where the Biodiesel portion of a Biodiesel/Petro Diesel blends is greater than 5%. Standard hoses are constructed with a Nitrile/PVC outer coating, which will quickly swell and become sticky when splashed with Biodiesel product.
- NSC have included a statement in Gilbarco's latest certificate of approval for current production dispensing equipment that it is suitable for use with Biodiesel provided it is constructed for that purpose.
- Fuel storage tank and supply lines need to be assessed for compatibility as some materials are not suitable for use with Biodiesel.
- There may be a requirement to clean existing fossil diesel tanks prior to using Biodiesel and Biodiesel blends >B5 (i.e. >5% Biodiesel). The use of fossil Diesel results in plaque building up on the inside of tanks, lines, pumps, etc. Biodiesel acts as a solvent (scrubber) and will loosen the plaque resulting in existing line filters blocking and/or clogging of meter, pump, air separator and nozzle ports. Therefore, filters may need to be fitted, if not already fitted, and existing filters will need to be cleaned or replaced soon after the introduction of Biodiesel and at regular intervals thereafter until all the plaque is removed.

As a general rule and as fuel quality may not be able to be guaranteed, a good approach for a Biodiesel fuel storage and handling systems would be to implement a regular maintenance schedule to clean strainers, replace filters and check equipment for potential failures and calibration variation.