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MONTHLY PROGRESS REPORT

(NTRD Program - TCEQ Contract Number 582-5-70807-0007)

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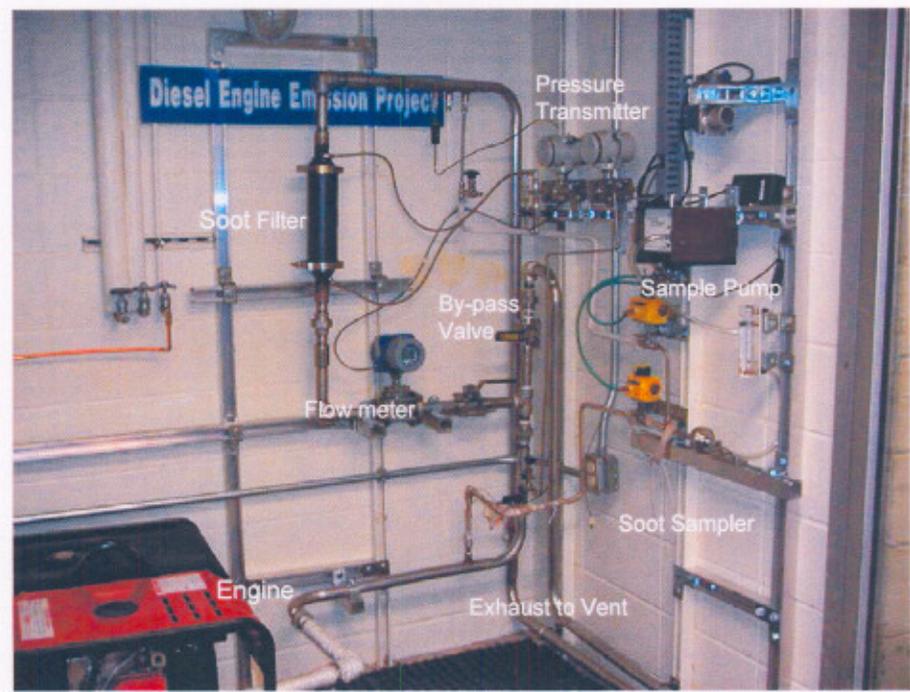
SUBJECT: September 2005 Progress Report

Date: September 15, 2005

The NOTICE TO PROCEED for this project was issued by TCEQ on May 31, 2005 and this is the fourth Monthly Progress Report. Specifically, the following progress has been made during this performance period:

1. Soot Testing System Completely Installed

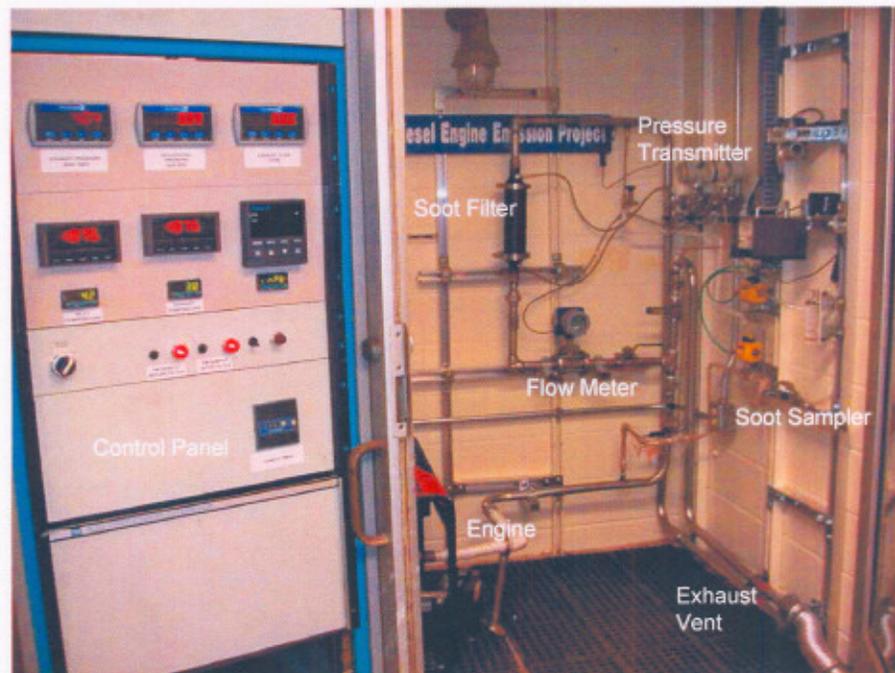
A schematic diagram of the experimental design for the testing of soot filtration efficiency associated with the proposed diesel particulate filter is shown again in Figure 1 in Attachment 1. All of the ordered components for the system have been received and the system has been completely installed in our laboratory. The picture shown below displays the installed system.



The following components for the soot removal unit have been installed as designed as shown in the picture in the previous page with key process signals connecting to the control cabinet:

1. GenPro GPD 6000 P Diesel Generator;
2. SKC Hi-Lite 30 Constant flow soot sampler;
3. Pressure transmitter for the inlet pressure and differential pressure for the soot filter;
4. Vortex flow meter to measure engine exhaust flow to the soot filter;
5. Thermocouples for the system temperatures;
6. SiC wall-flow type soot filter; and
7. Engine vent line to the hood.

The following picture shows the installed system with the control panel.



2. Shake-down Test Conducted

A shake-down test of the installed system has been carried out in two different operation modes: the by-pass and the normal modes. The by-pass mode of operation is to line up the engine exhaust to the vent directly. The test data after 15 minutes of operation are shown in Table 1. A soot sample of 0.3 mg was collected in the sample filter for 15 minutes without load.

Mode of Test	Inlet Temp °C	Exit Temp °C	Inlet Pressure inch H ₂ O	Diff. Pressure inch H ₂ O	Flow Rate CFM
By-pass	170	-	2.99	-	-
Normal	182	69**	9.71	1.21	50***
** Need longer time to reach steady state *** Need fine calibration					

It is worth pointing out that, when operated in the By-Pass Mode, the exit temperature, the differential pressure, and the flow rate are not measured and therefore are not reported in the Table. The test indicated that the flow meter was not properly calibrated and was re-calibrated. The test also indicated that water might condense in the sampling line and it was corrected by applying heater tapes around the sampling line. Further tests will be conducted to make sure the system is ready for the soot control experiments.

3. Quartz Filter Holder for Microwave Regeneration Fabricated

A quartz holder for the SiC soot filter for microwave regeneration has been designed and fabricated by the Technical Glass Corporation. It will be used as the filter holder for regenerating soot-loaded filters using microwave irradiation. The installed microwave regeneration system is shown in the picture in the next page.

4. Follow-up Tests Planned

The DPF filter will be involved in the follow-up tests to determine:

1. DPF filter life by differential pressure; and
2. Optimum PM sampling time for filtered exhaust.

The soot-loaded filter will then be regenerated separately by microwave irradiation.

5. Testo 350 Portable Emission Analyzer Received

The project has received the Testo 350XL Emission Analyzer for simultaneous measuring the concentrations of six diesel exhausts, namely O₂, CO, NO, NO₂, SO₂ and C_xH_y, for characterizing the NO_x and VOC control efficiency associated with the developed technology. A training session is being arranged with the manufacturer to come to Lamar University to train our students to use the analyzer.

The next Monthly Progress Report will be submitted to TCEQ on October 15, 2005.

[Attachment 1]

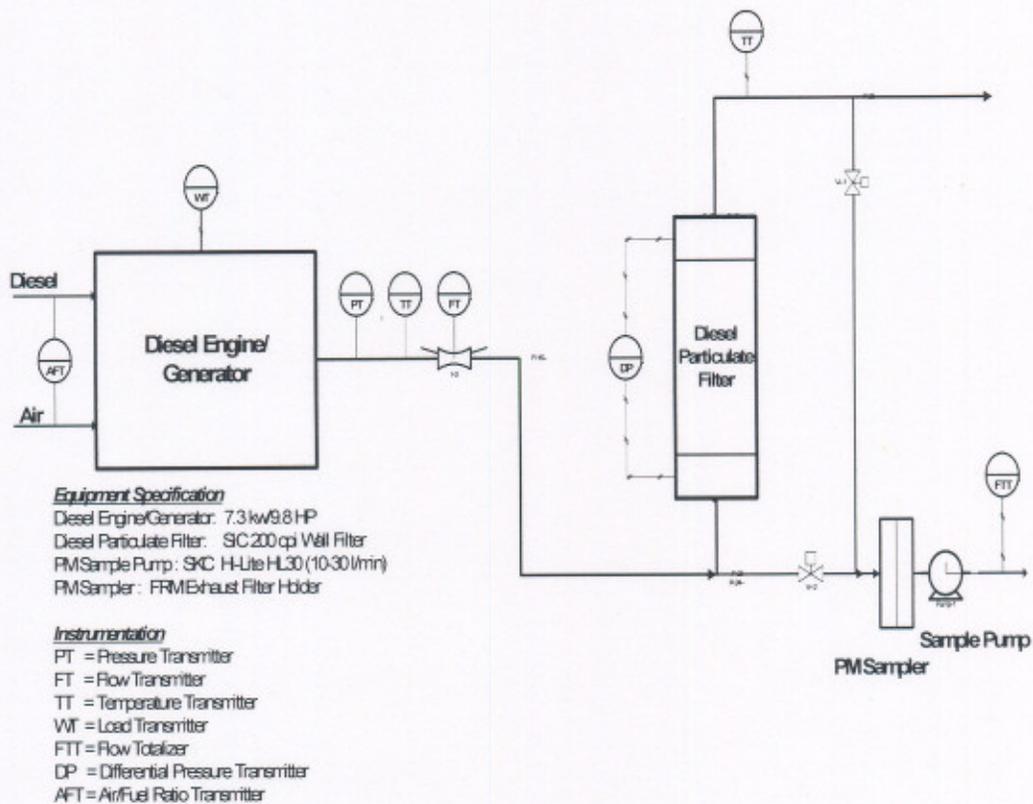


Figure 1. Experimental set-up for the measurements of soot control efficiency.