Excerpt from the STAFF REPORT released on October 24, 2003:

PROPOSED AMENDMENTS TO THE VERIFICATION PROCEDURE FOR IN-USE STRATEGIES TO CONTROL EMISSIONS FROM DIESEL ENGINES

4.2.1 Variability of Engine-out and DPF-out NO_2 Emissions

One issue raised by manufacturers is that the variability of engine-out NO_2 will reduce the ability of verifications to cover a range of engine families, thus dramatically increasing the cost of verification.

That comment has merit for the following reasons. Systems are verified on the basis of groups of engines and applications that are defined by parameters relevant to the system being verified (emission control groups). If a passive DPF is shown to work on a truck with an engine certified to a particular PM emission standard, it can be verified for similar engines that meet the same standard. If testing shows that a DPF meets the NO_2 limit on a particular engine, staff has no certification standard or database of NO_2 emission data for reference to assist in determining other engines for which the DPF can be verified.

Without taking NO_2 into account, the emission control group for which passive DPFs are currently verified is large and well-defined (nearly all 1994-2002 on-road engines). The same cannot be said when NO_2 enters the picture. All of the vehicles in the EC-Diesel Technology Validation Program were in that same emission control group (LeTavec, 2000). Figures 1 and 2 show NO_2 fractions[1] for vehicles in the program equipped with one of the verified DPFs. The data is sorted by test cycle in Figure 1 and by engine series in Figure 2. In each case, a wide spectrum of NO_2 fractions is observed, often ranging 30 to 40 percentage points for each subgroup. Such a spread is large given that the limit is set at 20 percent. The data suggests that both test cycle and engine-type can have a significant impact on the NO_2 fraction. That observation is especially significant given that (1) all of the engines tested were from the same emission control group, and (2) baseline testing of other vehicles in the same fleets with the same engines showed a low engine-out NO_2 fraction with little absolute variation (5.0±0.8 percent[2]). The implication is that the 1994-2002 on-road group may need to be further subdivided in some fashion, but there is no clear indication as to what parameters should be used to do so. Such a subdivision could make verification much more burdensome for the applicant as it attempts to determine with which groups of engines its product will meet the NO_2 limit.

Vertin, K. EC-Diesel Technology Validation Program Master Spreadsheet, Round 2. National Renewable Energy Laboratory. Updated August 21, 2002. Requests for the spreadsheet should be sent to: teresa_alleman@nrel.gov

[1] NO_2 fractions were calculated by staff using NO and NOx emissions data from the ECD Technology Validation Program's Master Spreadsheet (Vertin, 2002).

[2] Based on data from (Vertin, 2002), as above. This result is for a 95 percent confidence interval and excludes three instances where staff found negative NO_2 fractions.

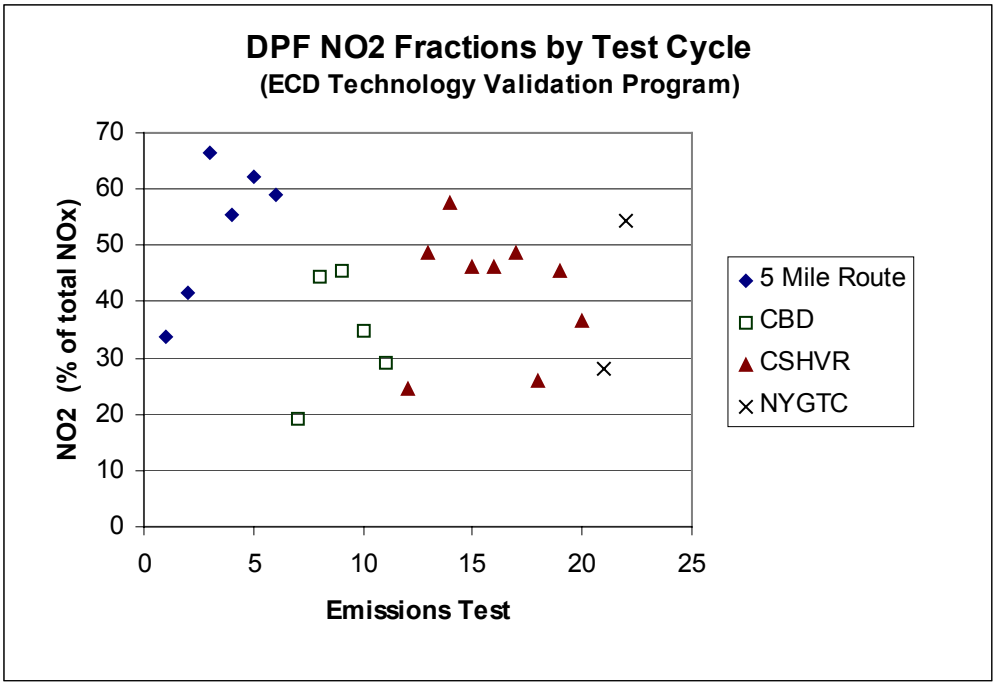

Figure 1. Note that CBD = Central Business District, CSHVR = City Suburban Heavy Vehicle Route, and NYGTC = New York Garbage Truck Cycle.

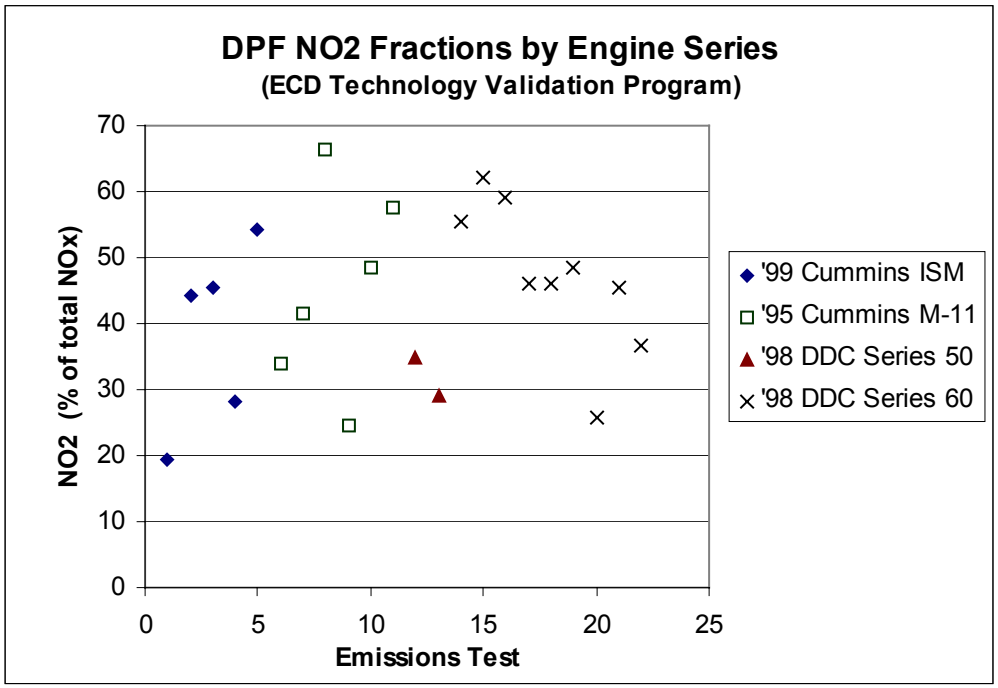

Figure 2.