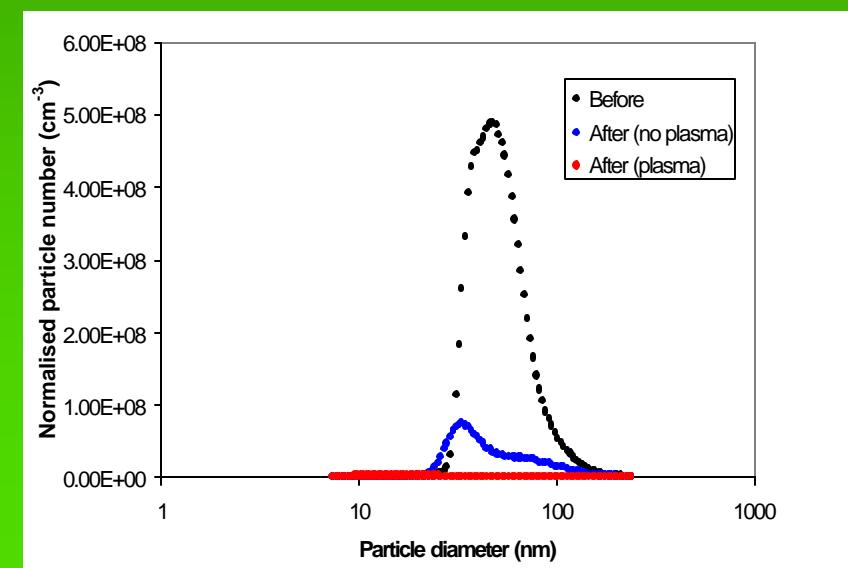
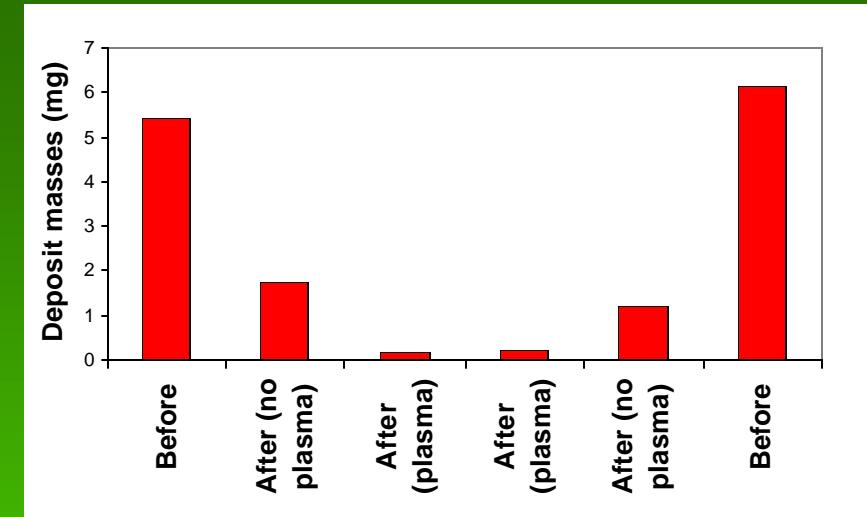
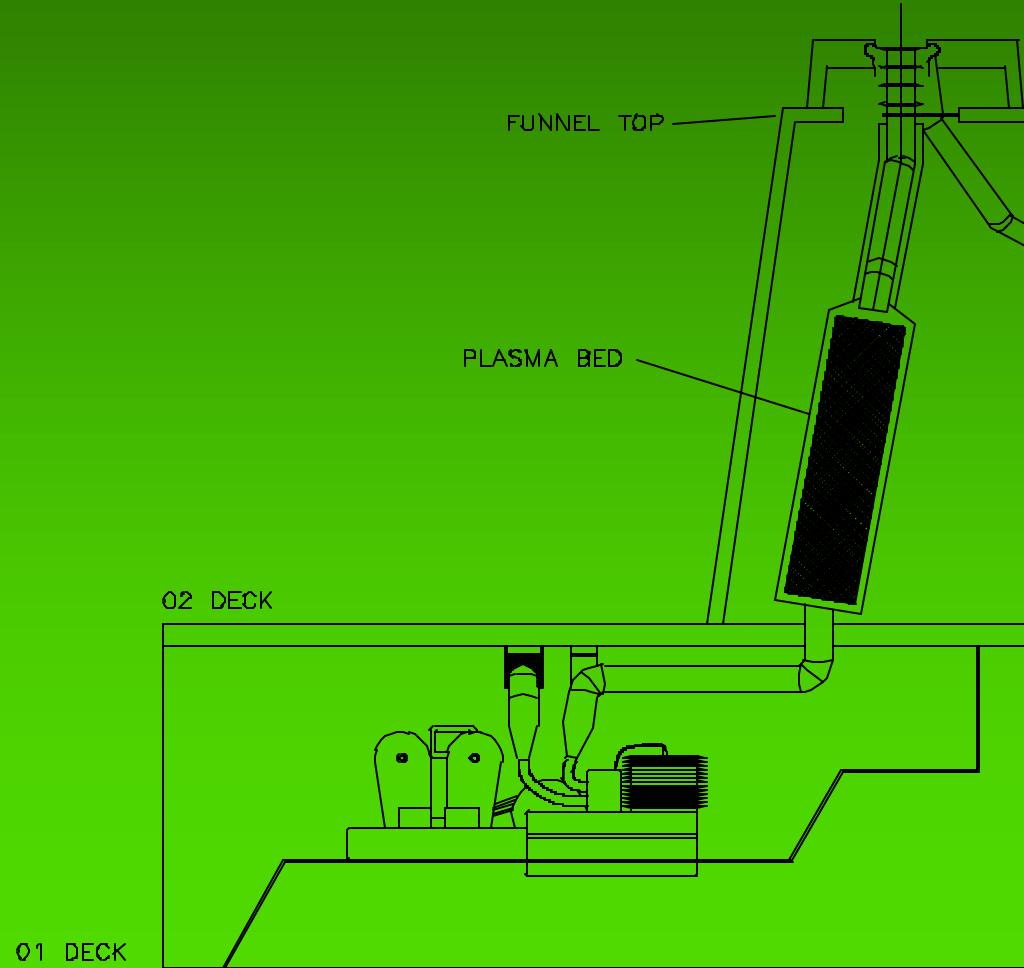


# NTP Treatment of Particulates



# Full-Scale System Conceptual Design

## *Replacement of silencer*

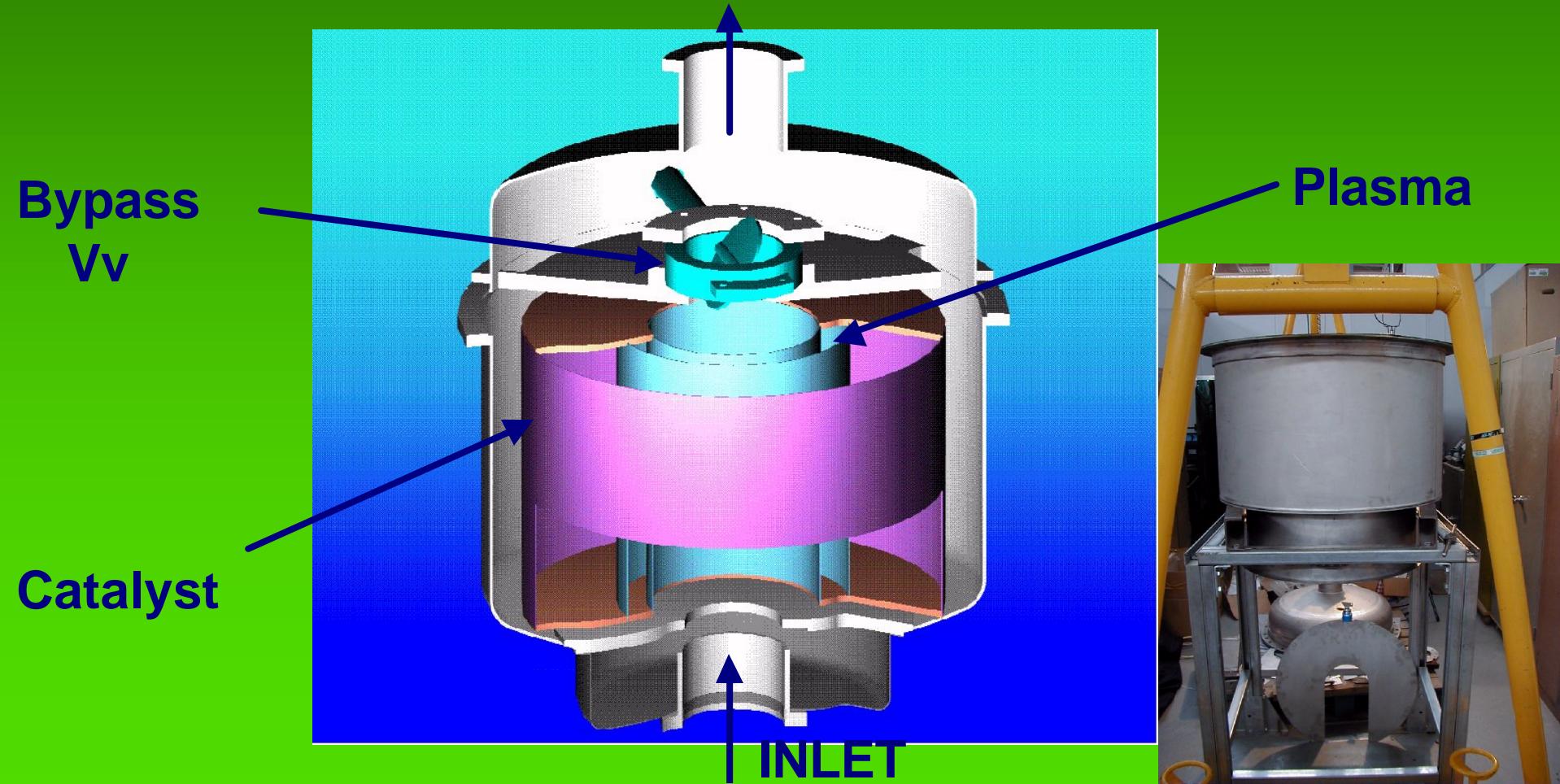




# Non Thermal Plasma Unit

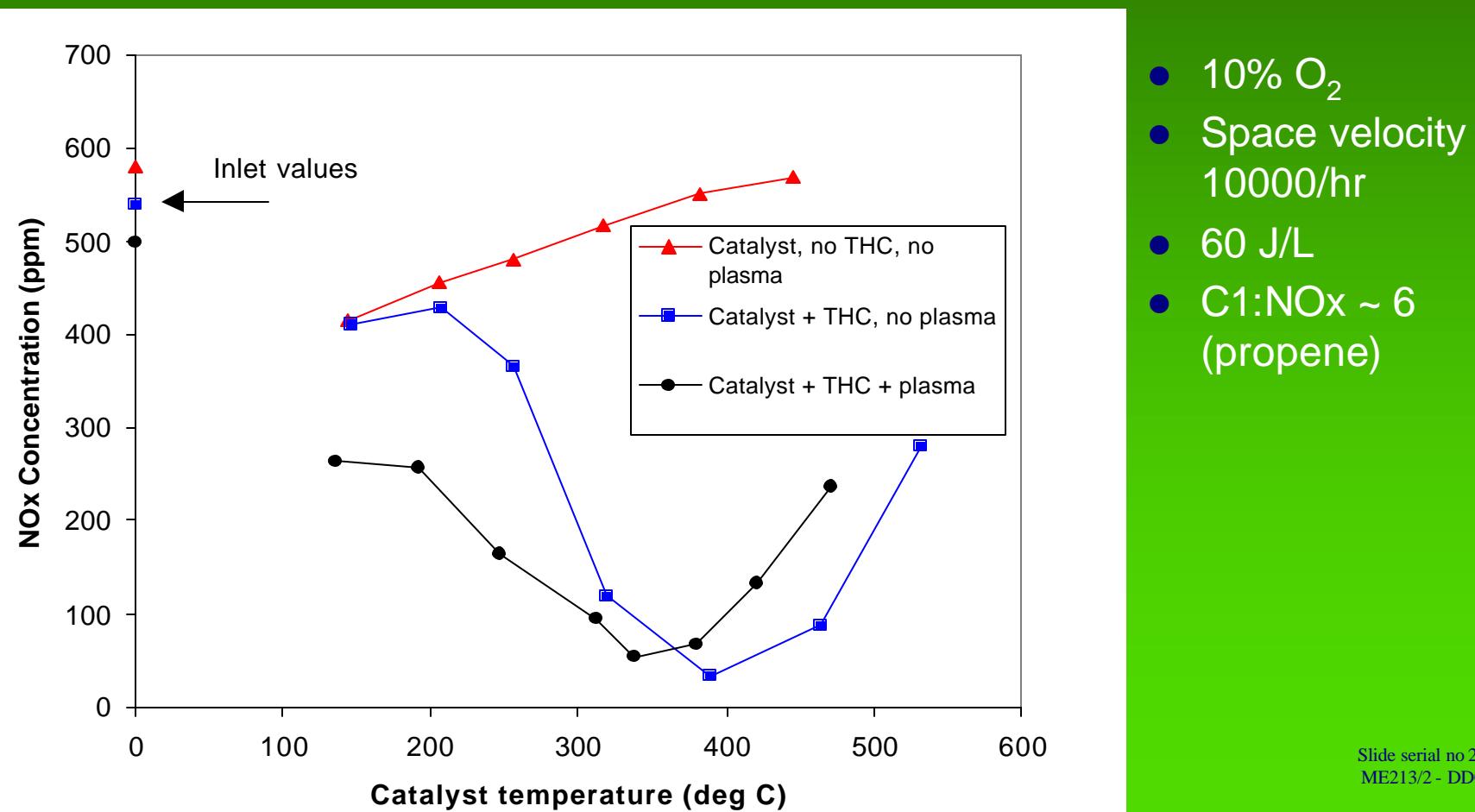
*Small scale - 1/10th Size*

- Procurement and Manufacture 1/10th Scale!!!!



# Laboratory performance

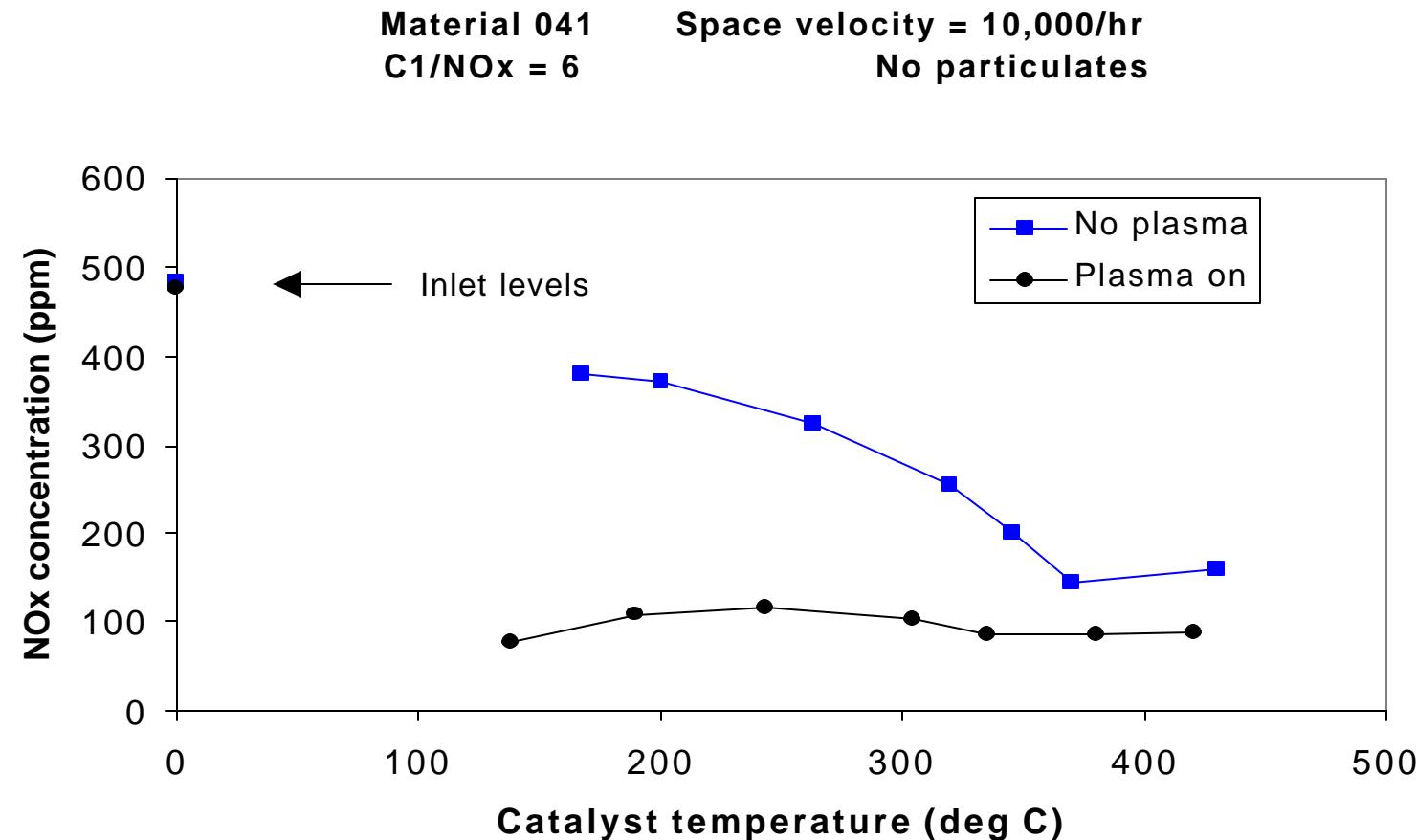
## Synthetic exhaust



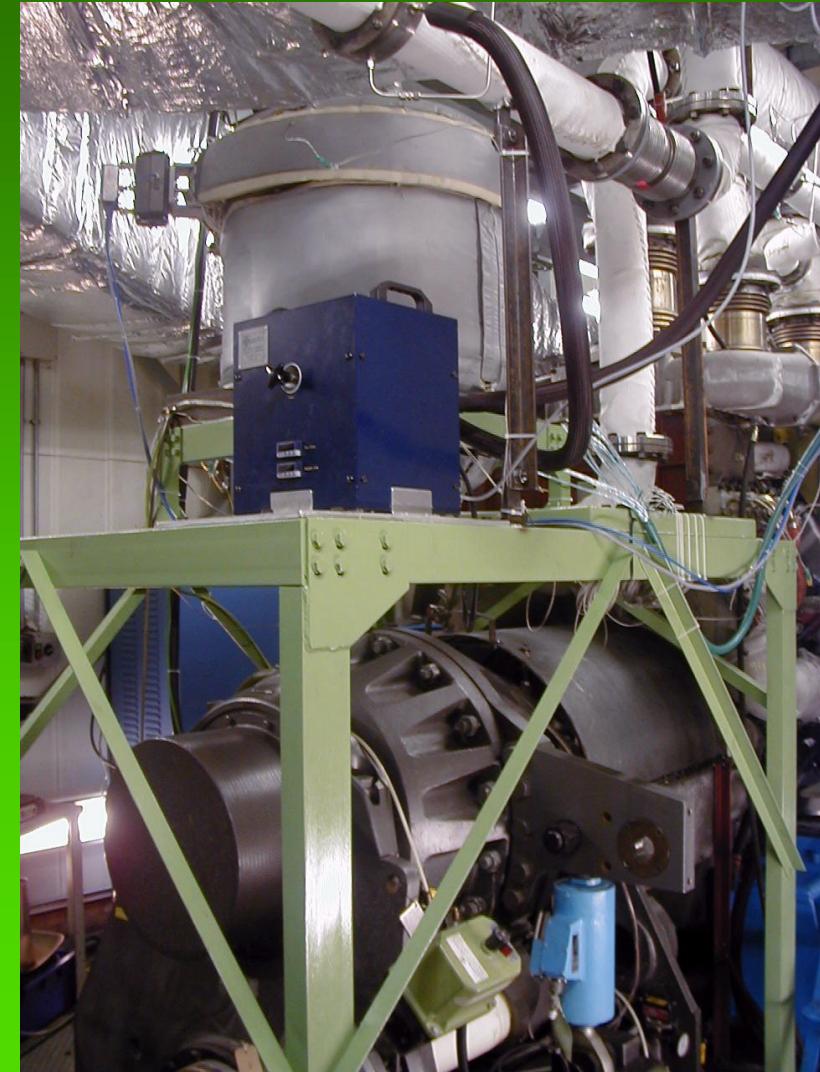
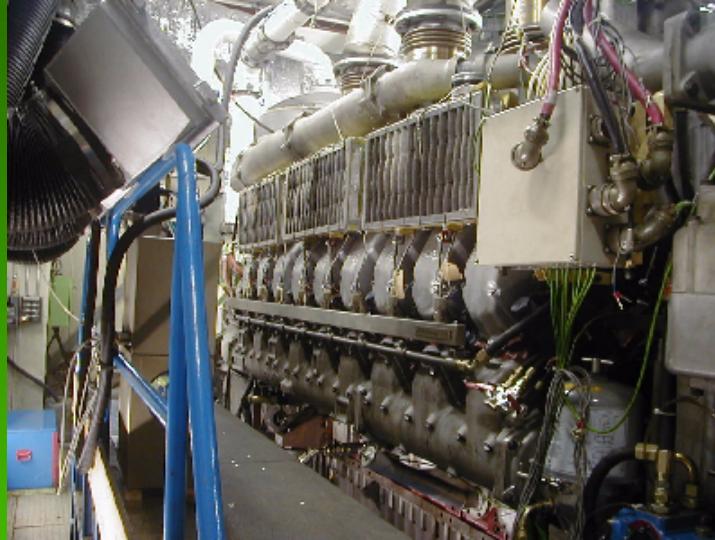


# Laboratory Performance

## Genset Exhaust



# Test cell at MAN B&W (Paxman's)





# Test modes

*D2 cycle - constant speed auxiliary engine  
(marine rating)*

<b>Test cycle type D2</b>	<b>Speed</b>	100%	100%	100%	100%	100%
		1800	1800	1800	1800	1800
		rpm	rpm	rpm	rpm	rpm
	<b>Power</b>	100%	75%	50%	25%	10%
		3250 kW	2438 kW	1625 kW	813 kW	325 kW
	<b>Weighting factor</b>	0.05	0.25	0.3	0.3	0.1

*Sprint mode - hotter exhaust temperature*

Speed - 1950 rpm

Power - 4000 kW

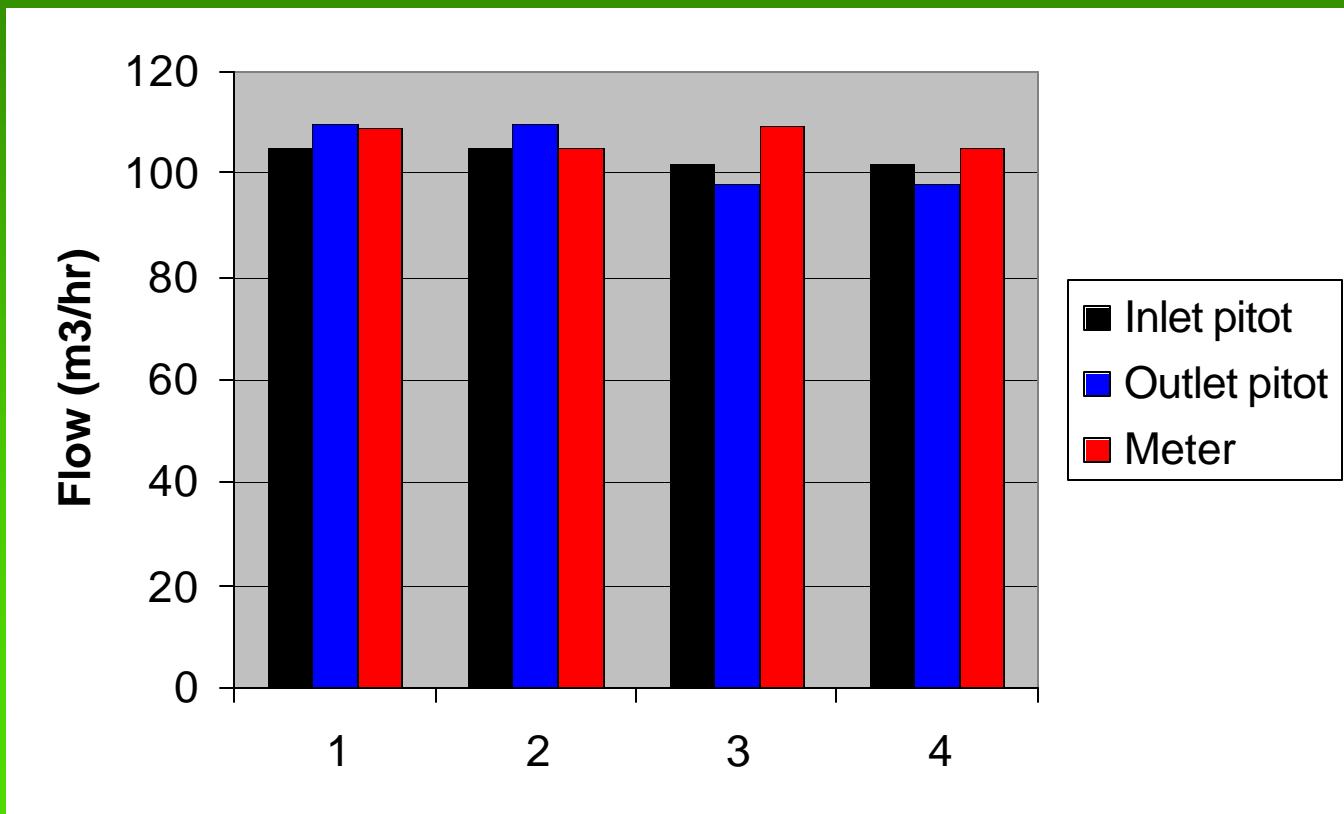


# Emissions Measurements

- Emissions bench
  - ◆ AVL CEB2 bench
    - ❖ NOx, NO, THC<sub>s</sub>, CO, O<sub>2</sub>, CO<sub>2</sub>
- Smoke measurement
  - ◆ Bosch Smoke Number
- Pre and post sampling

# Flow Measurement Validation

*Comparison with meter connected to pipework using a fan to push air through system.*





# Control System

**Navy Reactor Control Software**

File Monitor Data

HV Power Supply  
HV Enabled  HV Disabled

Monitor Status **MONITOR**

File Options  
File : 10 records saved to file NR69d.dat

WARNING - The difference between input and ouput gas flows is > 20%!

Reactor Conditions

Reactor  
67.1 °C  
Catalyst  
26 mbar  
25.2 °C  
301 m³/h  
240 m³/h  
329.2 °C  
192.2 °C  
203.7 °C  
181.9 °C

Ambient temperature: 25.1 °C  
Ambient pressure: 18 mbar

DC (A) 8.96  
DC (V) 361

15:19:56

**HV ON**

Flow In 0367  
Flow Out 0186

Display Power

Interlock Status  
Earth Sticks  
Emergency Stops  
Temp. Sensors  
Operational Limits

Diverter Valve  
Open  Closed

14.5  
10.0  
5.5  
-10.0  
-15.4  
-20.0  
Time (μs)  
V(kV) U.U  
I (A) -1.39  
-0.00  
-1.20

3.31  
1.00  
0.00  
P(kW)  
Time (μs)

Power: 2797 W  
Freq: 1987 Hz

