October 11th, 2023

To Whom It May Concern:

With regards to Cummins Power Systems (CPS) manufactured diesel generator set model **C3500D5e** rated for 50Hz operation and equipped with Cummins **QSK95-G5** engine:

When tested under the following conditions:

Table 1	
Fuel Specification:	ASTM D975 No. 2-D S15 diesel fuel with 0.0015% sulfur content (by weight), and 42-48 cetane number.
Air Inlet Temperature:	77 °F
Fuel Inlet Temperature:	104 °F (at fuel pump inlet)
Barometric Pressure:	29.53 in. Hg
Humidity:	NOx measurement corrected to 75 grains H2O/lb. dry air

Based on engine emissions validation testing, the table below represents the nominal performance and exhaust emissions data for the generator set listed above:

	Standby					
PERFORMANCE DATA	**0%**	**10%**	**25%**	**50%**	**75%**	**100%**
Power Output (kWe)	0	280	700	1400	2100	2800
BHP @ 1500 RPM (50 Hz)	175	563	1146	2117	3087	4097
Fuel Consumption (L/Hr)	68	127	222	382	551	725
Exhaust Gas Flow (m3/min)	118	160	238	376	508	626
Exhaust Gas Temperature (°C)	198	283	365	387	389	434
NOx (Oxides of Nitrogen)	1877	1824	1874	1866	1861	2226
NMHC (Nonmethane Hydrocarbons)	551	241	132	73	48	33
CO (Carbon Monoxide)	669	298	170	90	78	118
PM (Particulate Matter)	135	36	28	16	12	13
All emissions values above are cited as mg/ Nm3@5% O2, 0°C and 101.325 kPa.						

Steady-State emissions recorded per ISO8178-1 during operation at rated engine speed (+/-2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rates stabilized.

The NOx, HC, CO, and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. This data is subject to instrumentation and engine-to-engine variability. Field emissions test data is not guaranteed to these levels. Actual field test results may vary due to test ambient, site conditions, installation, fuel specification, test procedures, instrumentation and ambient correction factors. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

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Values provided in the table below are representative of "Potential Site Variation" for the AWS FRA site in Frankfurt, Germany. These values account for variances as indicated above without consideration of improper generator set maintenance.

	Standby					
PERFORMANCE DATA	**0%**	**10%**	**25%**	**50%**	**75%**	**100%**
Power Output (kWe)	0	280	700	1400	2100	2800
BHP @ 1500 RPM (50 Hz)	175	563	1146	2117	3087	4097
NOx (Oxides of Nitrogen)	2754	2676	2749	2737	2730	3266
NMHC (Nonmethane Hydrocarbons)	937	410	224	124	82	56
CO (Carbon Monoxide)	1338	596	340	180	156	236
PM (Particulate Matter)	308	90	70	40	30	33
All emissions values above are cited as mg/ Nm3@5% O2, 0°C and 101.325 kPa.						

The values in this letter are applicable for engines operating on ASTM D975 DF2 and paraffinic fuels conforming to EN15940, including Hydrotreated Vegetable Oil (HVO). Please consult Fluids for Cummins Engines bulletin # 3379001 for more information on the applicability of HVO.

The data and information provided in this letter is for informational purposes to assist customers in making purchasing decisions appropriate for their site-specific compliance needs. Owners/operators of compression ignition internal combustion engines are responsible for ensuring compliance with applicable local, state, and federal standards when CI engines are installed at the owner/operator site. The data and information contained herein regarding site variation values in particular should be considered as part of a site-specific compliance evaluation.

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Best Regards,

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