

STACK TEST AUDIT

Inspectors Ilka Bundy, John Kasper and Omar Horta met with Roland Taylor – UCF EHS, Curtis Wade – UCF Safety Engine Operator, Dale Lance – UCF Engine Operator, Bruno Ferraro – Grove Scientific & Engineering, Scott Bouchard, Jet Kent and Kent Childers – Windrock Inc., on 20 May 2014 to audit the stack test on UCF's 5,500kW CHP Engine. The 0950015-009-AO permit requires Method 1, 2, 3A, 4, 7E, 9, 10 and 18 to measure stack gas flows and properties, VE and pollutants VOC, NOx and CO. Bruno Ferraro conducted Method 9 VEs and Windrock Inc. conducted the other methods.

On 15 April 2014, Grove Scientific & Engineering conducted a Parametric Monitoring using a Fluke Meter with a K style thermocouple. EPD was told the urea pump flow was reduced due to safety issues.

Some of the instruments utilized during the current stack test were:

- Apex Instrument meter box wind 1
 - Calibration Results
 - Serial#: 1306022
 - Meter Y: 0.9966
 - Orifice ΔH : 1.864
 - Date due: 10/02/2014
- Horiba VA-3000 Analyzer, ID:24
- Gas Chromatograph SR1410, ID:22

The following data was collected during the audit:

- Operating rate: 5,500kW (100% load)
- SCR inlet temperature: ~744 °F
- Oxidation Catalyst inlet temperature: ~713.3 °F (~20 °F lower than the previous stack test)
- Urea rate: Run 1 ~4.86 gpm; Run 2 ~5.09 gpm
- Run 2 start cf: 263.684; End cf: 303.150
- Post test check leak conducted after run.
- All calibration gases were certified and current.
- Run 2 failed due to CO drift exceeded drift limit. ~6 ppm drift span of 20 ppm.
- Method 25A was not necessary due to the use of Gas Chromatography, Method 18.

FOLLOW-UP INSPECTION

John Kasper reviewed required recordkeeping with Roland Taylor. Several recordkeeping requirements were not met during the INS2 on 4/16/14. These items were noted on the summary table in the INS2 report as requiring compliance assistance. A follow-up inspection on these items was done during the stack test audit.

JMK found that Taylor now has access to a UCF database that contains engine maintenance and operation records for emergency generators, including malfunction and corrective action records. Included in the records are work orders showing that the EU 002 and EU 003 annual requirements for oil and filter changes and belt, hoses and air filter inspections are done annually, along with other items not

required by the RICE regs. Taylor stated that he was told that UCF has no emergency generators with diesel particulate filters. Emergency generator recordkeeping requirements appear to be met.

Taylor provided the maintenance records and maintenance plan for the CHP engine. These records are kept in notebooks in the CHP control room. These records appear complete. Notification requirements in Subpart JJJJ appear somewhat vague, so JMK requested the initial notification for the CHP engine. Taylor found and provided the initial notification later that day. JMK suggested Taylor keep all formal and other notifications, including compliance test notifications, as items in a separate file. The recordkeeping requirements for the CHP engine appear complete.

The last item from the INS2 summary table was the apparent exceedences of operating parameter limits for SCR catalyst temperatures, urea injection rates and oxidation catalyst temperature. EPD thinks an administrative correction is warranted to change the permit limits to fit the actual operation parameters measured over a year's time and data from both stack tests. Though EPD will not issue a correction until the report of this year's stack test has been reviewed, we make the following observations based on initial data.

1. This year's emission data appeared to meet the permit limits, but the SCR catalyst temperatures and oxidation catalyst temperatures were all about 20°F lower than last year's readings. This indicates that the catalyst temperature ranges in the -009-AO permit are too tight, particularly on minimum temperatures.
2. The urea flow rate used this year was similar to that used last year. The apparent exceedence is for minimum urea flow rate, at 2.5 gph vs a 3.5 gph minimum. We note that the engine NOx control system varies urea flow rate based on measured NOx in the engine exhaust. A low urea injection flow rate indicates a low NOx reading, so the low urea flow rate indicates these was no NOx emission exceedence.

The compliance summary table for the 4/16/14 INS2 was updated to show the FUI results, as shown below.

EU	Description	Parameter	Permit Cond.	Actual Max	Permit Limit	Period	IN, MNC, SNC, Comp Assist
All	Facility-wide	Equipment Lists	FW.5	Updated lists on-site			IN
		Exempt gas use	FW.6.b.	80.71 MMCF/12 mo	375 MMCF/12 mo	5/2013	IN
		Exempt diesel use	FW.6.c.	14,316 gal/12 mo	64k gal/12 mo	1/2014	IN
		NOx	FW.6.d.	7.09 T/12 mo	50 T/12 mo	4/2013	IN
		CO	FW.6.d.	4.36 T/12 mo	50 T/12 mo	3/2014	IN
		VOC	FW.6.d.	0.96 T/12 mo	60 T/12 mo	3/2014	IN
002	Emergency Generators (40 CFR 63 ZZZZ)	Diesel use, EU 002	A.12.b	18,800 gal/12 mo	133k gal/12 mo EU 002 + EU 003	3/2014	IN
		Engine operating hours	A.12.c	Viewed records	N/A		IN
		Fuel Type	A.12.d, A.13	ULSD	ULSD	2013, 2014	IN
		Engine reports	A.12.e	Records: see database	Maintain records		IN
		Malfunction records	A.12.f	Records: see database	Maintain records		IN
		Engine Maintenance	A.12.g, A.6	Records: see database	Maintain records		IN
		Corrective Actions	A.12.h	Records: see database	Maintain records		IN
		Operation/Maintenance	A.12.i, A.8	Records: see database	Maintain records		IN
003	Emergency Generators (40 CFR 60 IIII)	Diesel use, EU 003	B.11.b	7,682 gal/12 mo	133k gal/12 mo EU 002 + EU 003	3/2014	IN
		Engine operating hours	B.11.c	Viewed records	N/A		IN
		Fuel Type	B.11.d, B.12	ULSD	ULSD	2013, 2014	IN
		Installation/Maintenance	B.13.a	Records: see database	Maintain records		IN
		Engine Standards	B.13.b	Records: see database	Maintain records		IN
		Diesel Particulate Filter	B.13.c, B.8	Not Applicable, no DPFs	Maintain records		
004	CHP Generator	SCR Catalyst Temps	C.16.b, C.4	727 °F min to 793 °F max	762°F +/-30°F	7/13 min 1/14 max	IN (Admin Corr)
		Urea Injection Rate	C.16.c, C.4	2.5 gph min to 5.3 gph max	3.5 gph to 5.5 gph	5/13 min 9/13 max	IN (Admin Corr)
		Oxidation Catalyst Temp	C.16.d, C.4	695 °F min	700 °F min	7/13	IN (Admin Corr)
		Operating Hours	C.16.e	6,694 hr/12 mo	8760 (used for test frequency only)	3/14	IN
		Nat Gas Usage	C.16.f	329.37	No limit (50 MMBTU/hr)	3/14	IN
		CHP NOx	C.16.g	1.31	No EU limit, facility-wide only	12 mo ended 3/14	IN
		CHP CO	C.16.g	0.70	No EU limit, facility-wide only	12 mo ended 3/14	IN
		CHP VOC	C.16.g	3.04	No EU limit, facility-wide only	12 mo ended 3/14	IN
		Maintenance Plan	C.17.a	Records available	Maintain records		IN
		Maintenance Records	C.17.b	Records available	Maintain records		IN
JJJJ Notifications	C.17.c	Records available	Maintain records		IN		