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April 19th, 2016

Ministry of the Environment and Climate Change
135 St. Clair Ave. W.
1st Floor
Toronto ON M4V 1P5

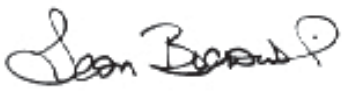
Attn: Lubna Hussain, Manager
Standards Development Branch

RE: AMESA Work Plan
Durham York Energy Centre (DYEC)
Environmental Compliance Approval Number 7306-8FDKNX (ECA)

Following our conference call of April 8th, please find attached an AMESA Work Plan in fulfillment of Technology Standards Section (TSS) comments made on the 2015 compliance source test report. The intent of the plan is to harmonize the strategy that will be used to assess the reliability of the AMESA system with ongoing testing.

As always, please call if you have any questions regarding this plan.

Sincerely,



Leon Brasowski

CC:
Mr. Guillermo Azocar, MOECC
Mr. Phil Dunn, MOECC
Ms. Sandra Thomas, MOECC
Mr. Gioseph Anello, Regional Municipality of Durham
Mr. Greg Borchuk, Regional Municipality of Durham
Mr. Seth Dittman, Regional Municipality of York
Mr. Matt Neild, Covanta
Ms. Amanda Huxter, Covanta

AMESA Long Term Sampling System Work Plan

April 19, 2016

1.0 Introduction

The AMESA Long Term Sampling System (LTSS), installed on each of the two units of the Durham York Energy Centre (DYEC), is a dioxin and furan continuous sampling system designed to meet the requirements of ECA condition 7. (3). It is designed to extract a sample of flue gas from the outlet of the air pollution control system on a continuous and isokinetic basis for the duration of the sampling period. Dioxins and furans are adsorbed on a replaceable trap filled with adsorbent resin (XAD-2) which is spiked with an internal standard by the laboratory that will complete the analyses following the designated sampling period. The short term objective of this Work Plan is to set forth an outline of the strategy to complete the performance evaluation of the LTSS. Following this evaluation, Dioxins and furans emission trends and/or fluctuations may be able to be observed as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers.

The LTSS was started up and maintained in accordance with guidance from the AMESA manufacturer, Environnement S.A. Deutschland (ESAD, the European manufacturer of the AMESA system), and the North America vendor Altech and the AMESA Technical Manual (June 2010). A DYEC- CEMS AMESA Trap Replacement Standard Operating Procedure (SOP) (C ENV 001) was developed and implemented based upon Altech guidance which was subsequently updated to include new Altech procedures. The new procedures were implemented following the initial evaluation of the LTSS which occurred during the initial DYEC source test in October 2015.

Initial AMESA sampling operation was done with blank cartridges to ensure the system was able to withdraw a sample isokinetically. Subsequently, the AMESA probe was removed from the duct during refractory cure of the boiler when oil was combusted. The AMESA LTSS probe was put back into service just prior to the conduct of RATA testing.

The AMESA probe was managed in accordance with Altech procedures that stated;

1. LTSS probes are to be cleaned utilizing instrument air only, back flowing instrument air through the nozzle and into the duct,
2. LTSS is “purged” of any contamination buildup followed by sampling with a blank cartridge for a period up to 48 hours.
3. No chemical or physical cleaning of LTSS probes was recommended.

Using the above procedures and in conformance with the Source Test Plan submitted to the MOECC, the initial evaluation of the AMESA LTSS on October 27th and 28th consisted of three (3) paired tests utilizing a minimum sampling period of four hours. Each paired set included a single point AMESA sampling result with multi-point source testing in accordance with reference USEPA Method 23. The term “multi-point” means that an EPA Method 23 nozzle was used to extract flue gas and moved to various points across the duct diameter during the test program. The multi-point sample plan for Method 23 is consistent with procedures conducted during conventional stack tests. The AMESA system uses a single fixed point in the center of the duct to sample the flue gas.

2.0 Initial Evaluation Conclusions

The evaluation of the LTSS was conducted in two steps: first the evaluation of the sampling rate of the DYEC system was conducted to determine if the flue gas sample system met isokinetic standards; subsequently, an initial evaluation of the capability to monitor dioxins and furans was initiated. The specified range for the sampling system evaluation is 95 – 115% isokinetic flow pursuant to the AMESA vendor. A minimum of nine flow measurements were taken on each unit. This evaluation concluded that the AMESA system is capable of sampling at an isokinetic rate from a single point at 108% and 106% for unit #1 and unit #2 respectively. The ability to maintain this isokinetic flow successfully is understood to be a key parameter for any long term dioxin sampling system to generate representative data of long term DYEC operation. This includes the ability of the system to automatically adjust to changes in flow due to changes in the steam generation rate and resultant flue gas flow rate. The continuation of demonstrating isokinetic flow will be made from subsequent AMESA LTSS validation tests matched against reference method test flows to verify the operation of the AMESA system.

3.0 Proposed AMESA Work Plan

Subsequent to the conduct of the initial evaluation of the AMESA LTSS, Covanta requested that Environnement S.A Deutschland and Altech together verify the installation of the AMESA system prior to any additional validation tests. As such, both companies will be present at the DYEC during the week prior to the next scheduled source test, to be conducted during the week of May 2, 2016. Additional procedures for managing the sample probe were provided by AMESA LTSS and Altech will be implemented in accordance with the attached ESAD procedure beginning with the source test in May 2016. The new ESAD procedures include a rinsing process of the nozzle and inner tube with distilled water, acetone and toluene. ESAD has also recommended that the sampling period for each validation comparison test be increased for two reasons; 1) to acquire additional sample which would possibly avoid non-detects of specific isomers, and 2) acquire additional sample volume consistent with the total sample volume collected with reference Method 23. This requires each paired test to be a nominal six (6) hours in duration.

As recommended by ESAD, subsequent validation testing of the AMESA system will continue to utilize a RATA approach, as utilized in the initial validation program which is also consistent with the procedures ESAD has utilized in European installations. As the RATA approach was proposed in the initial Source Test Plan, it is envisioned that the AMESA validation program would continue in such a manner until at least nine (9) valid AMESA samples are collected concurrently with reference Method 23 samples for each DYEC unit. Covanta may revisit and modify this work plan or the related SOP's at any time to make modifications as additional data is collected. Modifications deemed necessary will only be made following consultation with the ESAD, the AMESA vendor, the Regions and their consultants and the MOECC. While we are aware of a recently proposed publication by BSI, (April 2015) addressing technical specifications for long term sampling systems for PCDD/PCDF such as the AMESA, the proposed procedures have to date, not been independently verified for use. Following, validation, the BSI procedures maybe considered as warranted to further evaluate the performance of the AMESA system.

ESAD noted that long-term sampling AMESA operation (28 +/- day sample periods) do not require the additional solvent cleaning procedure prior to new sample traps being put into operation. ESAD, does, however, at this time, recommend the use of the solvent cleaning procedure every six (6) months. Such semi-annually cleaning may not be required in the future as dictated by the analyses of the rinse. Ongoing performance of the AMESA system will also include evaluation of long term data collected (28 +/- day sample periods) between the next the scheduled semi-annual validation test periods.

Environnement S.A
Deutschland

Cleaning of AMESA sampling probe with changeable inner tube

1. Stop the cooling water flow.
2. Disconnect the flexible tubes from the Pitot tube
3. Disconnect the thermocouple (electrical plug on cartridge box).
4. To remove of the titanium bend between the probe and the cartridge box unfasten the clamp on the cartridge box.
5. To unfasten the union nut, which fixes the titanium bend with the probe you need two combination wrenches, one 22 and one 27. The combination wrench 22 you need to secure the probe during the unfastening of the union nut.
6. Loose the screws of the probe holder (it is fixed on the flange or flue gas channel)
7. Turn the probe in such a position, that the water connections show upwards
8. Disconnect the water tubes (**be careful, the water could be hot!!!!!**) and remove the water as much as necessary into a vessel
9. Turn the probe so that the water connections shows downwards and let flow the water into a vessel
10. Loose the clamp screw which holds the inner tube so that you're a able to move the inner tube
11. Remove the inner tube by pulling it out of the probe
12. Clean the inner tube according the cleaning procedure described below.
13. Move the cleaned (or a new) inner tube into the probe. Take care that you push it until the end. You have to feel a resistance before you reach the end.
14. Fasten the clamp screw which fixes the inner tube
15. Turn back the probe on the measurement position
16. Fasten the screws of the probe holder
17. Connect the water tubes (take care for inlet and outlet)
18. Connect the titanium bend again to the probe and the cartridge box.
19. Connect the flexible tubes onto the Pitot tube (take care for ´+´ and ´-´)
20. Connect the thermocouple
21. Start the cooling water

Cleaning of the probe (acc. TUV report)

The inner titanium tube of the sampling probe must be rinsed normally in 6-month intervals (i.e. during the half-yearly maintenance measures) using the following liquids in the sequence outlined below:

1. highly pure water (for residue analysis)
2. highly pure acetone (for residue analysis)
3. highly pure toluene (for residue analysis)

This rinsing process must start at the nozzle; using the same solvent, the rinsing direction is then reversed. The probe tube must be turned several times during the rinsing process to ensure wetting of the surface on all sides. Each rinse requires 50 to 100 ml of liquid. All rinsing liquids must be collected in a glass vessel that can be firmly closed by means of a screw-on lid, and stored until the analysis results from the sampling process following rinsing have been submitted.

The mentioned rinsing solutions are also mentioned in EN 1948-1 Attachment B chapter 7.9.

In case of sticky contaminations inside the tube we recommend to use our special plastic brushes to clean the inner tube mechanically.

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