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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

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Title - Sujet Test Cell Analysis Control System	
Solicitation No. - N° de l'invitation K8A21-200244/A	**Amendment No. - N° modif.** 001
Client Reference No. - N° de référence du client K8A21-200244	**Date** 2019-11-01
GETS Reference No. - N° de référence de SEAG PW-$$PV-956-77857	
File No. - N° de dossier pv956.K8A21-200244	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2019-12-03	**Time Zone** **Fuseau horaire** Eastern Standard Time EST
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Courteau, Robert	**Buyer Id - Id de l'acheteur** pv956
Telephone No. - N° de téléphone (343) 550-1614 ( )	**FAX No. - N° de FAX** ( ) -
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Canada

Question:

Can you please provide a detailed list of the equipment and its communication structure with which the Test Cell Analysis Control System will be required to interface/communicate?

Answer:

There are six main pieces of equipment that the test cell control system (TSCS) will need to interface to, a constant volume sampling system, an exhaust analysis bench, a particulate sampling system, a test cell condition monitoring system, a dual axle chassis dynamometer and a non-regulated emission sampling system.

1) Constant Volume Sampling System (CVS)

The CVS consists of a total dilution 'tunnel' with three selectable critical flow venturis used for changing the total flow through the system. There are six sample pumps in the CVS which are turned off and on to control samples being taken from the tunnel. These are as follows:

1) Sample Pump: used to collect a gaseous sample from the tunnel and transfer it to a tedlar collection bag

2)Ambient Pump: used to collect a dilution air sample from the test cell and transfer it to a tedlar collection bag

3)Bench pump: used to transfer collected sample and ambient gases from the tedlar bags to the instrument bench

4)Evacuation Pump: Used to empty ambient and sample bags in preparation for the next test sequence. This pump can also be configured through a series of solenoids to fill the sample and ambient bags to perform a purge sequence.

5)Modal Analysis Pump: Used to take a continuous sample from the tunnel and transfer it to the instrument bench for a second by second analysis of the tunnel concentrations (and masses).

6)Continuous Total Hydrocarbon (THC) Pump: A seperate heated pump used to take a continuous sample from the tunnel and transfer it to a dedicated heated THC instrument within the instrument bench to perform an integrated analysis of the tunnel concentrations (and masses).

The CVS contains four sample and four ambient tedlar sample collection bags. For each of these bags there are a series of solenoids which control whether each bag is being filled, read or evacuated. These solenoids are used in concert with the previously mentioned pumps.

The CVS has temperature and pressure transducers which are read by the main control system to determine instantaneous tunnel flow through the critical flow venturi in standard cubic feet per minute (SCFM).

There is a main blower controlled by the CVS which is responsible for drawing the exhaust (and ambient air) through the critical flow venturi. The CVS also has a series of heated line controllers whose output can be monitored and logged by the TSCS.

The CVS has its own controller which individually (or collectively) turns on and off the pumps and valves to perform higher level functions (i.e. fill sample bag 1, read ambient bag 2, evacuate all bags etc.) The electrical connection to the CVS controller is either though ethernet, TTL level serial, or RS485. The controller uses an AK communication protocol to receive commands from and transmit data back to the TSCS.

All of the specific AK commands for the CVS will be shared with the winning bidder and we will work with the bidder to ensure that the AK command set can be made compatible with the bidders system. For example, if the bidder's command set has one AK command that turns on the evacuation pump and related solenoids but our CVS system does it in separate discrete AK commands, we will change the CVS system to do be able to do it in one AK command.

2) Exhaust Analysis Bench

The exhaust analysis bench consists of six exhaust emissions measurement instruments, Carbon Monoxide (CO), Carbon Dioxide (CO2), Oxides of Nitrogen (Nox), Total Hydrocarbons (THC), Methane (CH4) and a continuous Heated Total Hydrocarbons (HTHC). These are manufactured by Horiba Instruments and California Analytical Instruments. Each instrument has an accompanying array of solenoids which control flow of span/zero and sample gases to the instruments as required. There are a total of four span gasses available for each instrument.

The exhaust emissions bench has its own controller which interfaces to the individual instruments as well as their respective solenoids. This controller can be connected to from the TSCS via Ethernet TCP/IP sockets, TTL serial or rs485. It uses an AK communication protocol to receive commands from and transmit data back to the TSCS.

Some of the commands (per instrument) include Standby, Measure, Zero gas, Span gas, Select Range and Autocalibrate. All of the commands and their specific AK syntax will be shared with the winning bidder and we will work with the bidder to ensure that the AK command set can be made compatible with the bidder's system.

3)Particulate Sampling System

The particulate sampling system is an AVL Smart Sampler 478 GEM 140. The electrical connection to this system is via a Windows Ethernet switch over TCP/IP or via the built-in RS-232 port on the Smart Sampler Control Cabinet. Details of the request, setting and control AK commands are detailed in the AVL Smart Sampler (GEM140) AK Reference and Error Codes manual available from AVL. This manual will be shared with the winning bidder.

4) Test Cell Condition Monitoring System

The test cell condition monitoring system consists of a test cell temperature sensor, test cell humidity sensor, test cell atmospheric pressure sensor along with 12 analog input, 16 digital output and 16 digital input channels which are used for project specific additional data logging. The system has its own controller which can be connected to via Ethernet TCP/IP sockets, TTL serial or rs485. The controller uses an AK communication protocol to receive commands from and transmit data back to the TSCS.

All of the specific AK commands from this system will be shared with the winning bidder and again we will work with the bidder to ensure that the AK command set can be made compatible with the bidder's system.

5) Dual Axle Chassis Dynamometer

The Dynamometer is a Burke E. Porter 4601 4WD Modular MIM Dynamometer which consists of rolls, motors and drives, torque and speed measurement systems, supporting frames, wheelbase adjustment system, automatic floor system and proprietary controls. The dynamometer control system is capable of accepting set point commands from a supervisory (host) system for Speed, Torque, and Road Load Mode and can supply speed, torque and load signals back to the supervisory control system if required.

A dynamometer interface is provided for system integration with some commonly used auxiliary equipment in vehicle tests on the dynamometer, such as data acquisition system, vehicle cooling fan, emission bench, and driver’s Aid. There are three analog speed signal outputs, one analog torque signal output, one digital speed signal output in pulses, digital I/Os and dry contracts.

The TSCS system would have to, at a minimum, read the analog dynamometer speed signal for integration into the drivers aid system as well as the digital signal speed output in pulses for distance measurement.

6) Non-regulated Emission Sampling System

The non-regulated emission sampling system consists of a series of valves and pumps which draw a dilute exhaust sample from the tunnel and collect it in small individual tedlar sample bags and impingers (used for post test analysis in a chemistry laboratory). The system is configured for four individual test phases. The system has its own controller which can be connected to via Ethernet TCP/IP sockets, TTL serial or rs485. The controller uses an AK communication protocol to receive commands from and transmit data back to the TSCS.

All of the specific AK commands from this system will be shared with the winning bidder and we will work with the bidder to ensure that the AK command set can be made compatible with the bidder's system.