

# SAMPLE SPECIFICATION

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## CEMS DATA ACQUISITION SYSTEM

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# **PART 1 - GENERAL REQUIREMENTS**

## **A. PURPOSE OF THIS SPECIFICATION**

To define a Data Acquisition and Handling System (DAHS) for Continuous Emission Monitoring which meets all federal and state regulatory monitoring requirements.

## **B. RELATED DOCUMENTS (to be attached)**

- State, and local requirements as applicable.
- Operating Permit
- Installation site drawings

## **C. SUMMARY OF SPECIFICATION**

- Part 2 of this Specification includes a description of the plant, process, and installation site conditions including composition of gas to be measured.
- Part 3 of this section of the Specification contains the technical and performance requirements of the Data Acquisition and Handling System.
- Part 4 of this section contains the requirements for services to be provided. This includes but is not limited to:
  - a. Services to be provided by DAHS supplier
  - b. Work and material by others:

## **D. SUPPLIER QUALIFICATIONS**

1. All suppliers of equipment supplied by this specification shall have an acceptable history of supplying satisfactory reliable systems in use for a period of at least five years.
2. Acceptable bidders must be analyzer manufactures as well as system suppliers.
3. Acceptable bidders must have ISO 9001: 2015 quality certification.
4. Acceptable bidders must be financially solvent and be able to show upon demand a net worth of at least ten times the value of the bid for this system.
5. The supplier must maintain a regulatory expertise and be committed to developing software solutions to meet future regulatory changes and requirements.

## **E. DELIVERY**

The supplier shall deliver equipment to the project site in accordance with manufacturer's shipping requirements. Project schedule requirements include:

- a. Drawing delivery \_\_\_\_\_
- b. Hardware delivery to site: \_\_\_\_\_
- c. Installation supervision: \_\_\_\_\_
- d. Startup of DAHS: \_\_\_\_\_

## PART 2 - PROCESS AND APPLICATION CONDITIONS

### A. PLANT

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### B. PROCESS AND FUEL(S)

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### C. EMISSION CONTROL EQUIPMENT

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### D. CEMS INSTALLATION SITE

Probe location \_\_\_\_\_

Analyzer cabinet \_\_\_\_\_

Sample line length \_\_\_\_\_

Other notable \_\_\_\_\_

### E. GAS CONDITIONS AT INSTALLATION SITE

#### 1. Gases to be measured and measurement ranges

NO<sub>x</sub> : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_ SO<sub>2</sub> :  
typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_ CO :  
typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
CO<sub>2</sub>/O<sub>2</sub> : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
H<sub>2</sub>S : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
Hg : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_

### F. OPERATING OR OTHER PARAMETERS

#### 2. Parameters to be measured and measurement ranges

\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
\_\_\_\_\_ : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_  
Opacity : range \_\_\_\_\_  
Particulate : typical concentration \_\_\_\_\_, max concentration \_\_\_\_\_, range \_\_\_\_\_

## **PART 3 - DAS SPECIFICATIONS**

### **A. FEDERAL REGULATORY REQUIREMENTS**

The DAHS shall comply with US EPA 40CFR60, 40CFR63, 40 CFR75, 40 CFR98, State of[*Insert State*] Regulations, and any other requirements of the attached permit.

### **B. DATA ACQUISITION SYSTEM**

1. The DAS shall provide for automatic data acquisition, data processing, report generation, graphical display of data, printing and/or storing reports in electronic format, email transmission of reports and alarms, archival storage of data, and providing secure remote access to the system via network connection.

2. The system shall utilize Windows 2016® or Windows 2019® as the operating system. The Data Acquisition System (DAS) shall be designed from the ground up as a Windows application taking full advantage of the inherent connectivity allowed by Integrated Security compliant applications. The DAS must be designed around a Microsoft® SQL Server Database.

3. Software and operating system requirements: The system shall:

- a. Have a user-friendly Windows® interface.
- b. Offer password protection on multiple levels.
- c. Allow the authorized operators to edit data, reason codes, and corrective actions using a user friendly editing program that allows for filtering and block editing of the data.
- d. Allow the authorized operator to log the CEMS out of service, out of control or off-line.
- e. Allow the authorized operators to archive data automatically or on demand.
- f. Allow authorized operators to create assorted browser based graphical displays of real time or historical data.
- g. Allow authorized operators to create graphical displays which can display browser based measured or calculated data as well as process signal direct from a PLC or Data Logger.
- h. Prepare reports automatically or on demand.
- i. Allow for user design and/or modification of reports.
- j. Allow remote access to all system functions via secure network connection.
- k. Allow expansion to accommodate revised regulations and/or measurement / calculation requirements.
- l. Be designed with server-client architecture.
- m. Be capable of interfacing and communicating with workstations via the plant LAN/WAN.
- n. Be capable of transmitting alarm messages, reports, etc. via email.
- o. Include a report generation program which is browser based and can be accessed from any network connected computer.
- p. Allow for easy sharing of data with common Microsoft software products such as Word® and Excel®.

- q. The DAS shall maintain the one-minute data in databases from which higher averages are computed and stored.
- r. The DAHS shall compute all data averages  $\geq$  one-minute as soon as data becomes available.
- s. One minute data shall be stored for at least 500 days (user configurable) and then automatically be deleted.
- t. Higher level calculated data shall remain on the system for a configurable number of years.

4. System hardware: The contractor shall provide a complete system designed for the best operation of the supplied DAHS. The configuration of supplied hardware will be the provider's responsibility, but the hardware must have state of the art speed and capacity ratings. The computer may be physical or virtual and should have the at least the following:

- a. Processor shall be a Quad Core Intel® Xeon® or Better
- b. System shall have at least 16 GB of RAM
- c. 4 Hot-swappable Hard Drives (500GB)
- d. Sound Card for Alarms
- e. External Hard Drive (for emergency Back-up)
- f. Laser Printer
- g. Color Flat Panel Monitor, 21" SVGA or larger

5. System Controller: The CEMS shall interface with the DAHS and be controlled from a commercially available programmable logic controller (PLC, GE Fanuc or Allen Bradley), a C3IO or RPD2 I/O device, or a Data Logger. The Controller/DAS shall be capable of automatic data storage and automatic retrieval in the event of an interruption of communications between the DAS and PLC. Data storage shall be for at least 168 hours. The PLC shall pass 1-minute data to the DAS and form 1-minute averages/validation for Opacity.

#### 6. Performance

- a. The contractor will guarantee the DAS/software will meet permitted reporting requirements.
  
- b. The supplier shall have successfully installed at least 250 DAS systems using the quoted software architecture.

## **PART 4 - SERVICES**

### **A. SERVICES TO BE PROVIDED BY CEMS SUPPLIER**

1. Installation Verification and Start-up
  - a. Provide instruction and guidance to the installing contractor for the equipment supplied under this specification.
  - b. Inspect the installed DAHS equipment after the installation is complete. Provide the owner with confirmation that the equipment is properly installed and is ready for start-up.
  - c. Perform start up and verify correct operation of all equipment supplied under this specification.
2. Certification Testing
  - a. Perform all necessary tests (if required) to ensure compliance with regulatory requirements.
3. Warranty
  - a. Provide warranty support 18 months after shipment; no maintenance contract required for this support.
4. Maintenance Services
  - a. Provide a 1 year maintenance contract to commence upon successful completion of the certification testing:
    - 1) Provide 1 year remote software maintenance agreement.
    - 2) Provide optional onsite maintenance agreement to cover the DAS and the existing CEMS.
5. Training Services
  - a. Provide factory training for owner's and technicians. Training shall be for a minimum of 16 classroom hours and cover the operation and maintenance of all components furnished.

### **B. WORK AND MATERIAL BY OTHERS**

1. Installation of equipment and components.
2. Installation of all cable and conduit exterior to any hardware furnished by this contract.