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INTERESTED SUPPLIERS

REFERENCE: Request for Information from Suppliers of monitoring technology to measure nitrous oxide (N2O) emissions – SIP, Austin Powder Argentina SA – Petrochemical Division

SUBJECT: Market Study - Invitation to quote, Continuous monitoring system for nitrous oxide (N2O) emissions in tail gas at a Nitric acid plant.

1. INTRODUCTION

The company Austin Powder Argentina SA (hereinafter "APASA") is carrying out a market study and analysis to contract to contract a continuous monitoring system for nitrous oxide (N2O) emissions for its production plant. nitric acid located on National Route. 16 km 653.5, El Galpón, CP:4444, Salta. Argentina.

This document includes relevant information so that interested suppliers of technology for continuous monitoring of nitrous oxide (N2O) emissions can participate in the market study phase, the objective of which is to determine the cost of goods, equipment and services, their availability in the market and their possible supply.

Interested companies must submit a budget, as well as the information required according to the Annex "Quote format and queries on supply."

In this sense, this market study is carried out prior to a bidding process, so the presentation of responses to it does not imply any (pre)selection for the supply of the equipment and services related in **SECTION 6-** SPECIFICATIONS - REQUIREMENTS OF GOODS AND SERVICES.

Following this market study, APASA will publish the bidding documents for the supply of continuous monitoring technology for nitrous oxide (N2O) emissions through an Open Public Bidding process.

2. DEFINITIONS AND ABBREVIATIONS

For the purposes of the technical documents that are part of this market study, the following terms will be used:

- **Market Study** : Procedure that is part of the previous stage of the supplier selection process, required for the acquisition of a specific good and/or service; This in order to establish and analyze the technical, commercial, economic and legal specifications of what is required to be contracted.
- **SCME** (**CEMS**): Continuous emissions monitoring system.
- **Goods and Services:** Supply of continuous monitoring technology for nitrous oxide emissions at the APASA nitric acid production plant, Argentina. The technical specifications are found in **6.2. TECHNICAL INFORMATION.**
- **Email address:** Corresponds to the address that APASA will use to receive the documents and forms corresponding to this market research and which corresponds to the one described below: licitacion.abatimiento@austinpowder.com
- **Website:** It is the exclusive website of APASA, on which this document and all the information that suppliers require to participate in the market research will be published and which corresponds to: https://austinpowder.com/argentina/sustainability/ and https://www.linkedin.com/company/austin-powder-argentina .
- **Plant:** Nitric acid plant located at El Juramento Plant – Austin Powder Argentina SA Petrochemical Complex Ruta Nacional 16 km 653.5, El Galpón, CP:4444, Salta. Argentina.
- **SIP:** Request for Information from Suppliers.

- **The CONTRACTOR/OFFERER** : will be the company selected in a Public International Bidding process to supply the Goods and Services described in **SECTION 6-** SPECIFICATIONS - REQUIREMENTS OF GOODS AND SERVICES.

3. GENERAL CONDITIONS.

APASA issues this document requesting information from suppliers (SIP), as a previous step to an international Public Tender for the acquisition of goods and services specified in **SECTION 6-** SPECIFICATIONS - REQUIREMENTS OF GOODS AND SERVICES. For all purposes of this document, a series of general specifications and conditions of the SIP are made:

3.1. All interested parties must complete and send to APASA **Annex 2 – *"Quote Request Form and Supply Queries (EN)"*** , which details questions regarding the Bidding process and the items to be quoted. All fields must be completed, including those related to the contact information of the bidding supplier, and sent via email to licitacion.abatimiento@austinpowder.com . Interested parties may also use another format (different from Annex 2), as long as the required information is clearly provided.

3.2. The response to this market research may be done in Spanish or English.

3.3. It is clarified that this SIP does not constitute a commercial offer and is not binding.

3.4. The information provided by interested parties may be used by APASA to construct the terms and conditions for the subsequent bidding process. Therefore, interested companies that participate in this market study by sending responses to it, declare that they know the use that will be given to the information provided.

3.5. The interested supplier will bear all expenses related to the preparation and presentation of responses to this market study. APASA will not recognize these expenses under any circumstances.

4. SCHEDULE FOR REQUESTING INFORMATION FROM SUPPLIERS.

The milestones of this market study will be carried out according to the following schedule:

No.	Milestone	Date
1	Publication of the Request for Information to Suppliers – Invitation to quote on the Website.	07/22/2024
2	Deadline to submit questions or observations to the Supplier Information Request.	08/12/2024
3	Deadline to respond to questions or observations issued	08/19/2024
4	Deadline for sending re-questions by interested suppliers about the clarifications and responses issued by APASA.	08/26/2024
5	Deadline to submit Annex 2 with the requested information in accordance with the market research process	09/05/2024

For the different milestones, the time of sending the respective email will be taken as the time of reception, in its equivalent to Argentina time, UTC-3.

The milestones of this market research will be carried out electronically, using the tools and resources indicated in this document. In the second round of questions, clarifications may only be requested regarding the answers provided in the first round of clarifications.

This market study schedule is subject to changes by APASA, which will be notified through the Website https://austinpowder.com/argentina/sustainability/ and https://www.linkedin.com/company/austin -powder-argentina . These changes will have the objective of facilitating the Market Research process, but never limit times for the presentation of responses by interested suppliers.

5. CONFIDENTIALITY OF INFORMATION.

APASA undertakes to handle the information of the interested parties with absolute confidentiality. In this sense, the information analyzed as a result of this request for information from suppliers – SIP, will be known exclusively by the APASA team, and there will be no different use of the information. than that described in this application, prohibiting the commercial, financial use of the information made by the Interested Party for any purpose other than those described here. APASA guarantees that it will not make any publication that includes sensitive information specific to the business with technical, operational and/or financial impacts of each of the quotes it receives in this market study call. The processing of personal data will be subject to the provisions of Argentine legislation – Law 11,723.

6. SPECIFICATIONS - REQUIREMENTS OF GOODS AND SERVICES

6.1. GENERAL SCOPE

This document presents complete technical information on the nitric acid production facility in order to provide suppliers with a sufficient database to answer specific questions regarding estimated costs and the possibility of offering a turnkey solution, among others.

However, this document is not intended to specify all technical requirements, nor to specify requirements already covered by applicable codes and standards. The supplier/OEM (original equipment manufacturer) that is awarded in the subsequent tender for which this market study is launched, must apply solid engineering and manufacturing practices and include all equipment and services not mentioned to deliver a unit suitable for the required functionality, which conforms to current industry standards.

6.2. TECHNICAL INFORMATION

Annex 1 provides relevant technical information to define the monitoring system to be installed.

6.3. SCOPE DETAILS (minimum requirements)

APASA will install a tertiary N2O abatement system (which will be covered by a separate tender and is outside the scope of this market research) and requires the installation of a SCME (CEMS). The supply of the monitoring system must be carried out on a turnkey basis.

The required SCME (CEMS) will consist of two sets of gas analyzers (the first directly upstream of the existing N2O reactor and the second downstream of this unit), both capable of measuring N2O concentration, a gas flow meter tail pipe that will be located in the chimney, sample conditioning system (one per set), sampling lines, valves, pipe fittings and data acquisition and management system (SCADA/DAHS), among other elements necessary, to monitor , store, analyze and make trend graphs of plant emissions.

The SCME (CEMS) must have QAL1 certification for typical plant operating conditions.

The supplier must take into account the "General specifications and design principles of the monitoring system" for the supply of the CEMS.

Monitoring equipment shall be installed and operated in accordance with the requirements of EN14181 (latest version), including regular maintenance and calibration.

6.4. ENGINEERING

The supplier will execute all engineering works, prepare all engineering documents, including drawings and interface documents, and prepare all associated documentation, such as operation and maintenance manuals and as-built documentation.

The supplier must prepare a master document list that includes all documents and drawings necessary to perform the work.

APASA will review general layout drawings and design drawings for acceptance prior to manufacturing.

The delivery will include all necessary engineering designs, risk assessments, strength analysis and equipment sizing. The supplier must provide the design documents in electronic and editable format.

Engineering, production and/or procurement, factory acceptance testing, site delivery, installation, commissioning, commissioning, on-site support, on-site testing to ensure warranty, training of plant personnel and supply of all the required documentation in two copies of the Continuous N2O Emissions System (one upstream and one downstream of the new abatement unit):

6.4.1. Flowmeter for Stack

Stack gas flowmeter certified under EN 14181 QAL1 including installation flange for the measurement of:

- Flue gas flow (volume or mass flow)
- Flue gas temperature
- Flue gas pressure
- Installation according to EN 15259

6.4.2. Sampling System

The sampling system will be hot extraction (wet base analysis). Gas sampling probe, heated sampling line, gas sample treatment.

- Sampling probe and installation flange.
- Heated sampling line suitable for aggressive environmental conditions, high temperatures and UV radiation
- Sample gas treatment unit with sample filtration pump

Note: Recirculation of sample gas to the chimney is not necessary.

6.4.3. Gas analyzers

Gas analyzers for measuring N2O (certified under EN 14181 QAL1).

- Range 1 N2O (upstream of the reactor): 0 – 2,000 ppm
- Range 2 N2O (downstream of the reactor): 0 - 200 ppm
- Range O2 (upstream/downstream of reactor): 0 - 20%.
- Must comply with EN 14181 - QAL1 - Data capture and evaluation

Note: must include hardware and configurations necessary for maintenance and/or remote diagnosis

6.4.4. Data collection and storage

Data logger with on-site display, automatic on-site backup: All raw data and all average values (1 min, 1 h) must be stored permanently without data compression, including hardware or configuration required for maintenance and /or remote diagnosis.
The monitoring system will provide separate hourly mean values for the N2O concentration in the tail gases before (upstream) and after (downstream) the N2O reactor, as well as for the tail gas flux, based on continuous measurements that They are recorded electronically

recorded and stored. These data sets are identified by a unique date/time key that indicates when exactly the values were observed. Overall reduction efficiency and emission reductions are calculated from the monitored values. The following data must be monitored and stored:

- N2O concentration before N2O reactor, [ppm]
- N2O concentration downstream of the N2O reactor, [ppm]
- Gas analyzer status (Operating, Under maintenance, Failure)
- Chimney gas velocity (Stack), [m/s]
- Status of flue gas velocity analyzer (operating, under maintenance, defective)
- Chimney gas temperature (Stack), [°C]
- Chimney gas pressure (Stack), [bar]
- Measurement of the mass or volumetric flow of Chimney gases, [Nm3/h or kg/h]
- Ammonia oxidation reactor temperature (signal provided by APASA), [° C]
- Ammonia oxidation reactor pressure (signal provided by APASA plant), [bara]
- Ammonia flow to ammonia oxidation reactor (signal provided by APASA), Nm 3 / h
- Ammonia-air ratio to ammonia oxidation reactor (signal provided by APASA)
- HNO3 production (signal provided by plant operator), [kg/h]
- HNO3 concentration (Determined by laboratory test)
- Plant operating status (signal provided by plant operator)
- Temperature in analyzer cabinet, [°C]
- 3x state reserve
- 3x analog reserve
- Calculated value: N2O emissions (kg N2O/h)
- Calculated value: N2O emission factor (kg N2O/ Tn HNO 3)
- Sampling rate: 2 seconds
- Calculation of hourly average values (for analog and status signals)

Note: The data acquisition and management system (DAHS) must comply with EN14181 on how to calculate, record and store emissions data.

6.4.5. The analyzer cabinet should be installed in an air-conditioned room or in a separate container.

6.4.6. Valves, pressure reducers, pipes, accessories, etc. for automatic application of calibration gas.

6.4.7. Zero gas and span calibration gas for N 2 and N 2 O with certificate of analysis from an ISO IEC 17025 accredited laboratory for both N 2 O measurement ranges

6.4.8. Rack for calibration gas cylinders

6.4.9. A spare parts fund for 3 years of regular maintenance, a list of standard spare parts specifications and a list of critical spare parts for proper operation will also be provided.

6.5. INSTALLATION AND ASSEMBLY.

All construction and assembly work will be executed by the CONTRACTOR/BIDDER according to the design standards and specifications of **section 7:** REFERENCESand the safety requirements that apply in APASA. It will be the responsibility of the CONTRACTOR/OFFIDER:

6.5.1. The supplier will install the monitoring system and will be responsible for commissioning the equipment in the plant with the support of local personnel.

6.5.2. Installation and commissioning: Supplier shall provide final mechanical completion verification, commissioning, commissioning and performance testing. If applicable, the supplier must provide the special tools necessary for installation.

6.5.3. Training local employees at the plant to operate and maintain the monitoring system (including training certificate). A trainer from the supplier must be present for sufficient time to ensure adequate APASA training. staff. A training schedule will be agreed.

6.5.4. In reference to documentation, all documents submitted for engineering review must be in Spanish. All final documents to be used by operational personnel, documents and certificates and legends on panels and instrumentation will be in Spanish

6.5.5. Annual maintenance of the complete analyzer system and data logging system for 3 years (remotely).

6.5.6. Analysis in coordination with the plant operator of the plant requirements for the installation of monitoring technology.

6.5.7. Engineering and design of the necessary construction works and plant modifications in coordination with the plant operator.

6.5.8. Civil works necessary for the execution of the project.

6.6. VERIFICATIONS

The tests will be carried out in accordance with the procedures indicated in the applicable standards.

6.6.1. Factory acceptance test (FAT)

Seller's or OEM's technicians shall test the entire system, including sample conditioning, in Seller's or OEM's workshop. The Seller/OEM shall prepare the procedure and provide all necessary test equipment to perform the Factory Acceptance Test (FAT).

The FAT must include, among others:

Simulation of all inputs and outputs, showing all associated initiators, alarms and trip action outputs. All simulated entrances and exits will be organized and labeled for easy identification during FAT.

Complete functional tests of the analyzer's ventilation and air conditioning system.

Alignment and cleaning.

Visual inspection of the sampling system.

An audit of the arrangements for the effective management and maintenance of the CEMS system.

Leak controls.

Bias checks (system integrity).

span calibration checks .
Linearity check.
Linearity check for N2O and O2 with 5 points for each range (20, 40, 60, 60, 80 and 90% of total deflection). In the case of a non-linear calibration curve, a minimum of 10 concentrations is required.
Response time.
Documentation supplied
The test gases used must be traceable according to the ISO 17025 standard.
Accredited suppliers will be used for calibration gas. The uncertainty of the gas mixture used will be better than ± 2% with 95% confidence for all gases according to ISO 17025 gas accreditation standards.

6.6.1.1. Test report

The test report will include, among other elements, the following:
References to applicable international standards.
Complete identification of sample gases and calibration: quality, concentration, uncertainties.
Circumstances in which the tests have been carried out: locations, conditions....
Sample programming: date and time.
Test results: calibration, lower limit of detection, precision, zero and range drift (including the effect of temperature), linearity, effect of interferences on the determinant, response time, standard deviations and systematic errors and a declaration of compliance with this specification.

6.6.2. On Site Test (SAT)

The CONTRACTOR/BIDDER will install the monitoring equipment and carry out the commissioning and commissioning of the monitoring system.

At the APASA plant, the supplier representative must install the monitoring equipment and test the system installation before commissioning. The representative must also perform the required OEM standard tests to verify proper system operation after startup. The supplier's representative must prepare the relevant documentation to report on the start-up activities on site.

Acceptance tests will be carried out under real operating conditions on a sample.

The stack gas flow meter and gas analyzers will undergo a QAL2 test shortly after installation. The OEM will assist the independent and authorized body in the first certification of the test system according to QAL2.

The CEMS shall have facilities that allow for in-plant and QAL 2 testing after installation, as well as facilities that allow for periodic maintenance and calibration.

6.6.3. Electrical installation

The CONTRACTOR/BIDDER will provide the engineering, materials and labor necessary for the construction and commissioning of all the electrical installations necessary for the perfect

functioning of the SCME Continuous Emissions Monitoring System (CEMS) object of this sheet. Including assembly work on power and lighting circuits, commands, conductor laying, grounding, etc.

6.6.4. Instrumentation and control

The CONTRACTOR/BIDDER will be responsible for carrying out all the tasks listed below, plus those necessary for the perfect functioning of the construction facilities, taking into account that the list is not limiting:

- Installation, assembly and connection of instruments.
- Laying of pipelines and power and signal wiring between the instrumentation and control room.

6.7. PROJECT DELIVERABLES

the project's deliverable engineering documents is listed below . It does not exclude or limit the delivery of other documentation that the CONTRACTOR/BIDDER considers necessary. All documentation must be delivered in digital format (editable PDF, DOC, XLS and DWG) with the exception of the equipment operation and maintenance manuals, which in addition to their digital copy must be delivered with two printed copies.

General:

- Design Basis
- Project Execution Plan
- Process description memory
- Process Flow Diagrams
- List of equipment
- P&I´s
- Line List
- Operations Guide
- Operation, Control and Safety Philosophy

Piping :

- Implementation of equipment (Lay Out of Equipment)
- Pipe Material Classes (Piping Class)
- Specifications and design typicals
- Descriptive report of pipes

Electricity:

- Detailed Descriptive Electrical Installation Report
- Line diagrams
- Technical Specification of Electrical Equipment
- List and load balance

- Electrical Materials List
- Electrical connection plan
- Connection diagrams

Instruments and control system:

- Descriptive memory of the instrumentation and control installation
- Typical Electrical and Mechanical Assembly of Instruments
- Communication Systems Specification
- Count of cables and installation materials
- Instrument Cable Conduit Plan
- Lay Out of Implementation of Instruments / Passage Boxes / Field Panels

7. REFERENCES

Listed below are the codes, national and international standards, specifications and recommendations, only applicable to the set of structures and equipment to be designed, modified or built.

This listing does not exclude specific norms, good practices and construction standards that apply to the technology to be supplied. THE INTERESTED PARTY must take them into account for their responses to the SIP.

Construction:

- ANSI/CEMA 550 (Conveyor Equipment Manufacturers Association): Classification and Definitions of Bulk Materials
- ASTM (American Society for Testing and Materials): The materials must comply with the ASTM standard.
- CIRSOC Std . 103 (mandatory): INPRES-CIRSOC Regulation 103 “Argentine Standards for Earthquake-Resistant Constructions”.
- ASCE Std. 7 (reference) : American Society of Civil Engineers Std. 7.
- AISC: American Industry of Steel Construction.
- D-1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort. (ASTM).
- D-1883: Standard Test Methods for CBR (California Bearing Ratio) of laboratory Compacted Soils. (ASTM)

Manufacturing:

- ASME B 31.3: “ Process “ Piping ”
- ASME B 16.25: “Butt welding Ends”.
- ASME B 16.5: “Pipe Flanges and Flanged Fittings NPS ½ Through NPS 24 Metric/Inch Standard”.
- ASME SEC I: “Rules for Construction of Power Boilers”.
- ASME SEC II: “Material Specification Part A – Ferrous ”.
- ASME SEC V: “ Nondestructive examination ”.
- ASME SEC VIII: “Division 1 Pressure Vessels ”.

American Institute of Steel Construction (AISC):

- AISC/ANSI 327-05 “ Seismic Design Manual
- AISC/ANSI 360-05 “Manual of Steel Construction”
- AISC 303-05 “Code of Standard Practice for Steel Buildings and Bridges”.
- RCSC “Specification for Structural Joints Using ASTM A325 or A490 Bolts”.

American Welding Society (AWS) :

- AWS D1.1/D1.1M:2006 “Structural Welding Code – Steel”

- ANSI/AWS D2.4-98 “Standard Symbol for Welding, Brazing, and Nondestructive Examination.”

APASA Design Specifications

- DOCUMENTATION CONTROL FOR DRAWINGS AP -ES-09
- PIPE-STRUCTURE PAINTING AP-ES-28
- PRESSURERIZED SYSTEMS AP-ES-31
- A1290-01-50-C01-ESP-201-0
- A1290-01-90-C01-ESP-001-4
- A1290-01-90-C01-ESP-004-3
- A1290-01-90-C01-ESP-005_2
- A1290-01-90-C01-ESP-006-0
- A1290-01-90-C01-TEC-001-0
- A1290-01-90-C01-TEC-421_0
- A1290-01-90-T09-ESP-202_4
- A1290-01-90-T09-ESP-201-1
- A1290-01-90-T09-ESP-203-2
- A1290-01-90-T09-ESP-204-0
- A1290-01-90-T39-TEC-201_C
- A1290-01-90-T11-ESP-201-3
- A1290-01-90-T11-ESP-201-4

8. RESPONSIBILITIES

8.1. Submission of Responses to the SIP:

THE INTERESTED PARTY must analyze all the documentation that is part of the description that accompanies the market study process. In the event of discrepancies, inconsistencies or lack of definition, the INTERESTED PARTY may inform APASA in accordance with the schedule defined in **Section 4- SCHEDULE FOR REQUESTING INFORMATION FROM SUPPLIERS.**These must be sent in writing via e-mail to the technical representative by the CLIENT.

9. WARRANTY:

9.1. Performance Guarantee

Parameters and specifications provided by the supplier. will be guaranteed. Limits and tolerance ranges will be declared and established.

Performance test will be carried out after installation, the system shall meet the performance test for 60 hours of continuous operation. Once the performance test is complete, commissioning will be completed and the system will be officially declared operational.

If the supplier is not successful due to faults or deficiencies revealed during the test, he must correct everything as soon as possible at no cost to APASA and then carry out a new warranty test.

9.2. Mechanical/electrical/electronic warranty

The equipment will be warranted against defects in design, material, welding, workmanship or otherwise, for all components of the equipment in operating condition.

The seller must guarantee the correct supply, machining, heat treatment, welding, corrosion protection and accessories as a mechanical/electrical guarantee.

Any defect, described here, that occurs during the warranty period, will give rise to the application of the requirements established in the particular and general commercial conditions.

9.3. General

The Guarantees described in the previous numbers 4.1. and 4.2. They make up the “Guarantee of Liability for defects and hidden defects” which must remain valid for 1 year (one year) from the date of delivery of the Goods to APASA facilities. The remaining warranty years offered by the Supplier will be covered by the manufacturer's or supplier's standard warranty without the need for a bank guarantee.

10. ANNEXES.

The list of annexes to this request for information from Suppliers is summarized below:

Annex 1 - Nitric Acid Plant Technical Specifications

Annex 2 - Request for Quotation and Inquiry Form for Supply

For the record, it is published on the 15 of July, 2024.

Responsible Signature.