NACAG Market Study
Question and Answer

Questions 1:

For the design of the tertiary abatement system it is important to know the composition of the tail gas, and regarding this point we have some doubts:

1) It is important to know the amount of water at the reactor inlet, could you send us this information?

Answer: The water content in the air stream entering the reactor is 570.4 kg/h (31.7 kg-mol/hr)

2) As the amount of N2O in the tail gas at the reactor inlet we are assuming 1500 ppmv, do you know this value or do you have a more precise estimate? Perhaps from Heraeus you have received information about the N2O that forms in gauze.

Answer: We do not have data on the content of N2O but We consulted Heraeus to obtain more information about it. We can take the content of 1,500 ppmv that they are assuming as rough data and if I obtain a more specific value, We will inform you.

2) What is the desired N2O concentration at the reactor outlet?

Answer: We expect an N2O reduction of at least 95% compared to the N2O concentration before the installation of the tertiary technology. Based on the assumed content, we could speak of 75 ppm of N2O at the outlet (in the case of NOx, the maximum value is 50 ppm).

Attached drawing: general plan of NOx gas abatement.

Questions 2:

- A preferred local contractor / list of local contractors that could provide the construction etc. We should team up with contractors you trust and already use on site.

  Answer: We are contacting some EPC's companies and will come back to you.

- Estimate on N2O value before current NSCR? 1000 ppm ? We do not have specific information on the N2O content but we can assume for the moment 1,500 ppm. If we get a more accurate value, we will define it.

  Answer: We do not have specific information on the N2O content but we can assume for the moment 1,500 ppm. If we get a more accurate value, we will define it.

- Is current NSCR reactor in a state where it could be re-used ? If so could you provide drawings ?

  Answer: The equipment could be re-used; it only depends on the volume of catalyst needed. Find the attached drawing

- Should the downstream burner be in-line or externally fired heater (i.e. adding the heat by heat exchange) ? The expander must be able to handle a higher flow rate if an in-line burner is to be used. Can we get info on natural gas availability and the expander datasheet?

  Answer: The objective is to install an indirect heater downstream of the abatement reactor. We do not have a defined limit for the use of natural gas for this heating; although we would like to consume as little as possible. Find attached information about the expander.

  Attached drawings: A1290-01-1042-M-GEN-003_B (STATUS A) and EB-2458-9

Question 3:

We are very interested in this project. We have an excellent product that will meet your needs outlined in your documents. As you suggest we are not in a position to easily offer an EPC quote without a partnership with a local contractor. We believe we have a superior product with out monolith tertiary N2O catalyst, but we would like to understand if there is a local contractor (possibly already working in the plant) that would be willing to partner with us for an offer.

Is there a company that comes to mind?

Answer: We are in the process of selecting possible EPC's companies willing to team with Technology Companies and come back to you

Questions 4:

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ITB specifies that "The proposed technology must guarantee a reduction in the N2O concentration between 95-99% compared to the current N2O concentration"

ITB documents do not specify the N2O current content to the NSCR.

1) Client to provide N2O content to the NSCR.

Answer: We do not have specific information on the N2O content but we can assume for the moment 1,500 ppm. If we get a more accurate value, we will define it.

ITB specifies that "Likewise, APASA requires that the technology to co-abatement NOx emissions from tail gases be included in this proposal and that this NOx abatement system does not depend negatively on the concentration of O2 (oxygen)."

N2O catalyst proposed by .... is decomposing N2O by thermal decomposition without any additional reductan. .... confirms the N2O abatement system can also manage the NOx abatement, but due to a large amount of NOx (5'500 ppmv), high abatement conversion is not achievable and this can be critical for a standard SCR with ammonia.

In addition this will require an ammonia mixer to fed ammonia to the catalyst to perform the SCR NOx reduction

2) Client to explain rason for this request since according to NACAG-ANNEX-001-Technical specifications of the nitric acid plant (EN) point 5.10 "NOx content after reactor (ppm) " is 50 ppmv showing that NSCR is already able to manage the NOX abatement.

Answer: The NOx content at the inlet to the gas abatement reactor is 5.000 ppm (approx. 3.000 ppm NO2 and 2.000 ppm NO). With the NSCR we are able to reduce the NOx down to 50 ppm, when the Pt gauzes of the ammonia reactor is new and when we reach plant stability (when the gauzes is on the end of run and when we have high ambient temperature, and high cooling water temperature it is difficult to maintain the low O2 content). We are interested in changing our current system (NSCR) to one that does not depend on O2 content to reduce NOx gases.

3) Is the request to abate NOx together with N2O mandatory?

Answer: It is not mandatory but we are interested. We could have two different catalysts in the same equipment (two beds) or two different equipments.

4) if so which is the NOX level required at the outlet of the abatement system?

Answer: 50 ppm

5) Is the project planning to remove the NSCR? Client to clarify.

Answer: The project is to reduce N2O gases but it is a good opportunity to replace the current NSCR system and we are interested in moving forward with this.

6) If NSCR is installed, why there is the need to increase the temperature to 610°C with indirect heating? Client to explain.

7) If Heating to 610°C is requested to be done through indirect heating system,

Answer: It is in our interest to replace the current NSCR system and with a selective system, it will probably not reach the proper gas temperature at the inlet to the expander.

The objective is to install an indirect heater downstream of the abatement reactor. We do not have a defined limit for the use of natural gas for this heating; although we would like to consume as little as possible.

8) ITB requires a turn-key project implementation. What shall you suggest to Bidders who does not have local construction and installation companies in Argentina?

Answer: We are contacting some EPC's companies and will come back to you

9) General plant information 1.3

The client to clarify the reason for having done a new commissioning in 2018.

Answer: The plant was operating in the 1960's in Canada and then the nitric acid plant was moved to Salta-Argentina and started up in 2018/19; operating continuously in 2020

10) Reactor Basket / Pressure Drop Data 4.3

Available depth for a secondary catalyst under gauze (mm) .

Client to confirm that N2O shall be done only with tertiary catalyst and that no II catalyst installation is envisaged in the frame of the project scope

Answer: Answered in point 2

General

11) After the round of questions and clarifications between APASA and Bidders, when shall the Technical Proposal be issued by Bidders?

Answer: Deadline for submitting Attachment 2: June 3, 2024

Schedule for requesting information from suppliers:

No.	Milestone	Date
1	Publication of the Request for Information to Suppliers – Invitation to quote on the Website.	04/15/2024
2	Deadline to submit questions or observations to the Supplier Information Request.	05/06/2024
3	Deadline to respond to questions or observations issued	05/13/2024
4	Deadline for sending re-questions by interested suppliers about the clarifications and responses issued by APASA.	05/20/2024
5	Deadline to submit Annex 2 with the requested information in accordance with the market research process	06/03/2024

12) As you may know, we are licensor, engineering company and supplier for the entire fertilizer industry. Could you please briefly describe your production plants in APASA (e.g. ammonia, nitric acid, ammonium nitrate, urea, etc…)?

Answer: To obtain Ammonium Nitrate, Ammonia and Nitric Acid are required, which are produced in the same complex:

- *Nitric Acid Plant: nitric acid is obtained by oxidation of ammonia, with a nominal production capacity of 180 tn/d*
- *Ammonia plant: Ammonia is obtained from the reforming of natural gas, with a nominal production capacity of 180 tn/d*
- *Ammonium nitrate plant: Ammonium Nitrate is produced by feeding a stream of gaseous ammonia and nitric acid into a reactor with adequate pressure and temperature conditions. This solution then goes through a concentration process to obtain ammonium nitrate in solution (ANSOL) or concentration, drying and conditioning to obtain ammonium nitrate in prill. Nominal production capacity of 257 tn/d*