“Nitrogen + Syngas is the conference for future business.”
Omar Takrouni, President, Jubail Fertilizer Company (Al Bayroni)

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670+ professionals representing

50+ technical papers and presentations

Operators – Pay just €700 (+VAT)

300+ companies and

12+ hours of certified technical training

50+ countries

80+ world-class exhibitors

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CRU's Nitrogen + Syngas has a 32-year proven track record of bringing together senior technical professionals to share experience and develop best practice. The respected four-day agenda incorporates practical workshops, industry insights from CRU's nitrogen analysts and other industry experts, and a comprehensive dual-streamed agenda, featuring 50+ high-level technical papers focused on the latest technology, process and equipment innovations, and operational best practice.

The content is guided by a technical steering committee of experts representing producers, licensors, and independent consultants, ensuring a high-quality platform for professional development and peer-to-peer learning.

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Testimonials

“Excellent event, informative and interactive technical sessions with a wonderful mix of networking opportunities.”
Christina Waller, Sales & Marketing Manager, ParFab Companies

“Nitrogen + Syngas is the venue to be updated about the state-of-the-art technologies, meet the industry experts, share experience in an informal environment.”
Massimiliano Sala, Syngas & Fertilizers Product Lead, Saipem S.p.A.

“Excellent platform for knowledge sharing, networking with delegates from key players of syngas, nitrogen and fertilizer units from all over the world, and exposure to the latest developments and operating strategies development.”
Waqas Shehryar, Process Engineer, Fatima Fertilizer Co. Ltd.

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Who you will meet

670+ delegates, from 300+ companies, based in 50+ countries

Companies who typically attend include:

- Abu Qir Fertilizers Co.
- Acron
- Agropolychim
- Al Bayaroni
- AlexFert
- Ammoni
- ANWIL
- Apatit
- Azomures
- Baltic Urea Plant
- Borealis
- CF Fertilisers UK
- Cherkassky Azot
- Dorogobuzh
- Engro Fertilizers
- EuroChem
- Fauji Fertilizer Company
- Fatima Fertilizer Company
- Helwan Fertilizers Company
- GPIC
- Grodno Azot
- Groupe Chimique Tunisien
- Grupa Azoty
- Incitec Pivot
- Indorama Eleme
- KazAzot
- Kemerovo Azot
- Kermanshah Petrochemical Industries
- Kuibyshev Azot
- LYB
- Ma’aden
- Metafrax
- Minudobreniya
- MOPCO
- Neochim
- Nevinnomyssky Azot
- Nitrogénművek
- OCI Nitrogen
- Odessa Port Plant
- Pardis Petrochemical Company
- PetroVietnam
- PhosAgro-Cherepovets
- Petrochemical Industries Co. (PIC)
- Rustavi Azot
- SABIC
- SAFCO
- Salalah Methanol Co.
- Sipchem
- SOCAR Methanol
- SORFERT
- Tarafert
- TOAZ
- Togliattiazot
- TOMET
- Uralchem
- Yara

“Unique opportunity for networking with managers of nitrogen fertilizer production companies and senior managers from leading technology licensors and EPC contractors”

Artem Lapko, Deputy Chief of the Department, Severodonetsky ORGHIM PrJSC

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For the latest agenda updates, please see the website

### Agenda at a glance

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Monday 4 March

08:00
Registration open sponsored by

08:00
UreaKnowHow.com Clinic: How to handle leaks in urea plants?
Hosted by UreaKnowHow.com
In c.75% of the major safety hazards in a urea plant, a leak can occur whereby corrosive ammonium carbonate and toxic ammonia will be released. This has already led to at least 36 casualties and 188 people injured. In nearly 90% of these incidents, the leak occurred suddenly, without any pre-warning.

In such a case, one enters into a challenging dilemma: Should one stop the plant immediately or is it possible to wait? Are all leaks the same? Or are some more critical than others? What are exactly the risks and how one can minimize the risks and avoid leaks?

This Urea Clinic will discuss the various possible kind of leaks in a urea plant and their consequences and safety risks. It will also discuss prevention and mitigation measures. The Clinic will discuss several historical cases, which can be used as guidelines but sometimes also can bring up surprising and unexpected learning points...

By means of lectures and open round table discussions, we aim to reach a better understanding of the specific safety risks of the various kind of leaks, leading to better decisions on how to handle leaks in urea plants.

Agenda:
- What are the safety hazards in urea plants?
- What are the different kind of leaks?
- What are the risks of a specific leak?
- What are the prevention and mitigation measures?

*Separately bookable at a cost of €100 + VAT for operators and €450 + VAT for all other delegates

09:00 until 12:30

Ammonia/Methanol Plant Workshop
Hosted by Kinetics Process Improvements, Inc.
Every Ammonia/Methanol plant operator strives to maximise the profitability and reliability of their plant, without compromising on safety.

This workshop will provide practical insights and realistic strategies for you to make better decisions in your plants.

Outline:
- Ammonia/Methanol process technology advances and their applicability
- Key considerations in the operation of critical equipment in ammonia/methanol plants
- Options for maximising reforming capacity
- Synchronising front end and synloop to maximise ammonia/methanol production
- Selected topics on best practices to improve safety and reliability in ammonia/methanol plants
- Corrosive Topics: Metallurgical pitfalls (to be covered only if time permits)

*Separately bookable at a cost of €100 + VAT for operators and €450 + VAT for all other delegates

09:00 until 17:30

Amine Experts Training Course
Hosted by Amine Experts
The training courses from Amine Experts are internationally renowned for the value addition to any job function that includes operating, modifying, servicing or managing an amine plant.

This training course provides a thorough grounding in amine operational theory, and field troubleshooting of amine systems in terms of corrosion, foaming and meeting treated product specification. The amine treating course has been presented more than 300 times worldwide, with more than 8000 engineers and operators benefitting from attendance. A condensed version of the course, normally lasting a full week, is offered at the Nitrogen + Syngas 2019 Conference in Berlin for the direct benefit of attendees.

Amine plants are frequently used to remove CO2 from gas streams prior to ammonia synthesis (in addition to many other applications). The course will be of immediate benefit to Plant Engineers, Operational Supervisors, Operators, NP Designers, Chemical Vendors and Facility Managers. Attendees from operating companies are recommended to bring relevant unit information like simplified EFD’s and current and historic plant operating data. The course will cover the fundamentals of amine treating for CO2 removal from gas streams and prevalent operational challenges and their solutions. It will be presented in an interactive format, allowing discussion with presenters and other attendees.

*Separately bookable €350 + VAT for operators and €700 + VAT for all other delegates

18.00 until 20.00
Haldor Topsoe welcome reception

*Please note simultaneous translation will not be provided for any of the sessions on Monday 4 March, but if delegates wish to be accompanied by there own translator, there will be no additional registration fee charged.

For more information, or to book your place, visit: www.nitrogensyngas.com
FUTURE TRENDS: THE ROLE OF AMMONIA IN THE NEW ENERGY ECONOMY

11:00 Catalyst deactivation in green Haber-Bosch process
Power-to-Ammonia, whereby ammonia produced by renewable energy sources is utilised as a Carbon-Neutral Liquid Fuel (CNLF), has seen increasing attention as an option for the fluctuating energy supply and demand balance from renewable energy sources. However, the intermittent production rates seen in the power-to-ammonia process can lead to catalyst deactivation, due to the presence of H\textsubscript{2}O and O\textsubscript{2}. This paper will present the results of a microkinetic model of ammonia synthesis and catalyst deactivation and the flexibility of Haber-Bosch reactor to the dynamic conditions of the feed.

Alireza Attari Moghaddam; Ulrike Krewer, Institute of Energy and Process System Engineering, TU-Braunschweig

11:30 Potential of ammonia as CO\textsubscript{2}-free fuel for power generation
CO\textsubscript{2}-free hydrogen energy will play an important role in developing a low-carbon society. Ammonia is a carrier of CO\textsubscript{2}-free hydrogen. However, cost and CO\textsubscript{2} reduction in the life cycle are key issues to utilise CO\textsubscript{2}-free ammonia fuel. In this paper, the supply chain of CO\textsubscript{2}-free ammonia and its life cycle assessment are summarised to discuss the potential of ammonia as a CO\textsubscript{2}-free fuel for power generation.

Mototaka Kai; Yasushi Fujimura, JGC Corporation
Yuki Ishimoto; Ko Sakata, The Institute of Applied Energy
Yuki Kudoh; Naomi Kitagawa, National Institute of Advanced Industrial Science and Technology (AIST)

12:00 50 mtpd and 300 mtpd ammonia plants based on renewable energy
Safety considerations, new CO\textsubscript{2}-free energy sources and increasing regulation are just some of the trends that have influenced an increased demand for smaller NH3 plants. This paper presents a study for alkaline water electrolysis-based (AWE) 50 mtpd and 300 mtpd ammonia backend using minimal simple equipment to reduce investment cost. In addition, the paper presents the ability to use AWE-based hydrogen to be fed into conventional ammonia plants, substituting natural gas.

Tobias Birwe, thyssenkrupp Industrial Solutions AG

For more information, or to book your place, visit: www.nitrogensyngas.com
Tuesday 5 March

TECHNICAL INNOVATIONS TO ENHANCE PRODUCTION ECONOMICS

14:00 Implementation of advanced process control system
This paper presents a new predictive and adaptive advanced process control system that uses process dynamics, thermodynamics, physical-chemical models, and operating economics to handle complex processes across widely variable operating conditions. Benefits of the system include improved plant operation; minimisation of operator intervention; minimisation of constraint violations with better safety guarantees; reduction of energy consumption; improvement of throughputs; and better process performance information.

Otmar Lorenz; Inoslav Loncarevic, Siemens AG
Nenad Zečević, UNB d.o.o.

14:30 Added value of digitalisation in the fertilizer industry
In the current climate, operators need to control and reduce CAPEX and OPEX to maintain competitiveness. In the context of industry 4.0, this paper will highlight the development of industrial analytics based on machine learning, operating data and equipment integrity status, that provide a decision-making support for owners of operating plants. Applying these allows for productivity and maintenance optimisation to be better planned, and can reduce unforeseen plant and equipment shutdowns.

Josh Ferrara; Inida Papa, Saipem S.p.A.

15:00 Improving efficiency and reliability to cloud-based connected services
Real-time optimisation and predictive maintenance algorithms running in cloud-based environments (IIoT platforms) are starting to shape the future of best-practice operation of chemical plants. Several “building blocks” are required for such a concept to successfully ensure real value for the plant operators. This paper will cover these “building blocks” and introduce how Topsoe, with a strategic partner, have developed a full-end-to-end connected services concept, targeting hydrogen and ammonia plant optimisation/efficiency and reliability, as well as on-the-job training of plant personnel.

Michael Fjording, Haldor Topsoe

15:30 Evolution of the design of the ammonia converter
To increase NH3 production, a considerable benefit is obtained if the volume of the ammonia converter is utilised more efficiently. This paper will detail design improvements to the converter that allow for the installation of more catalyst in a given volume and to better utilise the catalyst volume. The new design can be installed as a retrofit in an existing plant or in a new-build plant. Examples will be shared, including how the catalyst volume can be increased by more than 20% by the installation of a new cartridge into the existing pressure vessel.

Klaus Noelker; Evgeni Gorval; Klaus Pfudel, thyssenkrupp Industrial Solutions AG

COMMISSIONING CASE STUDIES

16:30 Commissioning of KBR’s first KRES + Purifier Technology ammonia plant at PAU
This paper will detail the successful commissioning of the 1900 MTPD PAU NH3 plant in Indonesia in August 2018. Commissioning of the plant was successfully completed in August 2018 with one of the lowest energy and natural gas consumption figures per ton of ammonia. This paper presents an overview of the project, unique features of this project, experience about the commissioning and start-up of the process facilities, the problems encountered and key lessons learned during the commissioning.

Annie Jing; Harsh Khanna; Sachin Agarwal, KBR TECHNOLOGY

17:00 Commissioning and start-up experiences of the Socar Carbamide project
This paper will give a detailed overview of the commissioning and start-up of the greenfield fertilizer project of the Socar Carbamide project in Sumgait, Azerbaijan. The project schedule, pre-commissioning, commissioning and initial start-up experiences; safety and performance metrics and lessons learned will be shared.

George van Bommel, BioTorTech BV

17:30 Key learnings and guidelines: Market exploration and commissioning of rental boiler for an ammonium nitrate production plant
This case study will provide a thorough overview of the successful commissioning of a rental boiler for an AN plant, including related checklists and guidelines, and key lessons and learnings. The issues faced in the commissioning phase encompassing the back fire safety incident, hazards identified in the PHA, inspection observations, operators’ skill certification and essential automation test, will also be discussed.

Muhammad Umar Munir, Pakarab Fertilizers Limited

18:00 Close of day two

19:30 Nitrogen + Syngas 2019 Party
Co-hosted by

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#CRUnitrogen
Wednesday 6 March Stream A: Ammonia, methanol and syngas

NEW PROCESS, TECHNOLOGY AND PROCESS DEVELOPMENTS TO INCREASE PRODUCTION

09:00 Improvement to water gas shift process
The water gas shift process is a key process in most ammonia plants. This paper will review a new shift product which extends life, allowing ammonia and hydrogen plants to increase their process reliability and production efficiency. The paper will review the new product development and its referenced application in large ammonia plants.
John Brightling, Johnson Matthey

09:30 Increase profitability, reliability and safety of your operation: New catalyst developments from Clariant
Catalyst performance is directly linked to the profitability of a plant, since the catalyst enables the chemical reactions which create the value for the plant owner. This paper will give an overview of new catalyst developments that include new promoted Sulphur absorber, performance reports from a new reforming catalyst in a European Ammonia plant and advancements in the water gas shift technology. The respective improvements are supported by case studies from the industry.
Ignaz Hoehlein; Norbert Ringer, Clariant

10:00 Flexibility and operational experience of the Linde Ammonia Concept (LAC™)
This paper details the main process steps of the Linde Ammonia Concept (LAC™) based on the first plants built, for both light hydrocarbons (LACTM.L1) and heavy hydrocarbons (LACTM.H). The product flexibility, which is based on the inert free syngas generation, allows production of co-products, such as industrial gases and methanol. Examples of NH3 production plants based on the LACTM will be highlighted.
Klemens Wawrzinek; Anton Jell, Linde AG
Carlo Brunazzi, Linde Azot Togliatti

08:00 Registration open sponsored by
Exhibition open
Auditorium sponsored by CASALE CLARIANT®

NEW INNOVATIONS IN METHANOL PRODUCTION

11:00 SynCOR Methanol™: The new low-cost route to methanol production
This paper describes a new route to methanol production - the Syncor Methanol™ process. The new route eliminates the need for a steam reformer, contains no tubes, and operates with a single burner in the top of the reactor, utilising Topsoe’s proprietary burner design. The process offers both economic and operational benefits, improved ease of operation, and faster turnaround, resulting in high on-stream performance, thereby improving plant profitability.
Birgit Zamorski, Haldor Topsoe

11:30 Integrated process designs: Ammonia derivatives
The concept of methanol-ammonia methanol co-production has a long history. There are many ways of producing both products in a single production asset. Co-production schemes can suffer from a degree of compromise because the incorporation of both MeOH and NH3 production capability into a single flowsheet can mean that the process conditions for both are suboptimal. This paper will detail a range of ammonia-methanol co-production technologies, which are both efficient and can accommodate any product mix.
John Pach, Johnson Matthey

12:00 AdwinCombined™: A striking innovation for the co-production of methanol and ammonia
This paper details a new technology that allows the production of methanol and ammonia in a highly integrated process plant concept. This new plant configuration leads to substantial reductions for both consumption figures and investment cost compared to two individual stand-alone plants. The process concept features the simultaneous operation of both product plants at nameplate capacity but also provides freedom of operation at partial loads. Furthermore, single operation modes are possible.
Christopher Frank, thyssenkrupp Industrial Solutions AG

For more information, or to book your place, visit: www.nitrogensyngas.com
Wednesday 6 March Stream A: Ammonia, methanol and syngas

**EFFECTIVE EMISSIONS MANAGEMENT AND CO₂ REMOVAL**

14:00 Overcoming problems with a pellet style SCR DeNOx unit in an SMR furnace
This paper describes operational problems experienced with a pellet type selective catalytic reduction (“SCR”) catalyst used for NOx reduction of a steam methane reforming (“SMR”) furnace flue gas stream, and how those problems were completely eliminated by changing to a corrugated honeycomb style SCR catalyst. The upgrade improved stack emissions and the production efficiency of the unit.

Klavs Beldring, Umicore
Ken Wohlgeschaffen, Chevron Products Company

14:30 Challenges in the operation of OASE solvent systems
Amine-based solvents for CO₂ removal in ammonia plants came into existence in the early 1980s and energy consumption of these systems were the lowest. Ever since, more than 200 ammonia plants were operating with BASF’s OASE solvent system which was earlier known as aMDEA. In this paper, the challenges in pre-commissioning, commissioning and operation of OASE solvent systems will be described.

Venkat Pattabathula, Incitec Pivot Ltd
Torsten Katz, BASF

15:00 Low NOₓ retrofit project to meet new EU emissions directives and increase efficiency
To meet new EU directives on emissions and increase throughput/capacity, a European fertilizer plant needed to replace 105 dual fuel (oil and gas) burners. The plant required the new burners to fire a single fuel, at NOₓ levels less than 120 mg/Nm³, CO levels less than 10 mg/Nm³, and noise levels less than 85 dB(A). EU directives on emissions require NOₓ levels not to exceed 100 mg/Nm³. This paper will share details of the burner retrofit solution.

Nigel Palfreeman; Nick Johnson, Zeeco Europe

**AMMONIA OPERATIONS**

16:00 Debottlenecking air compressors for increased production and profit
This paper addresses the issue of plant bottlenecks introduced by low climate-related mass flow, and addresses the various techniques employed to solve the problem. The paper will outline one particular technique in detail: hybrid suction air chilling, and discuss how it has successfully increased production at plants in the United States. Case study examples of successful production increases will be shared.

Eric Warren, Everest Sciences

16:30 Challenges of operating an ammonia plant in Libya
Libyan Fertilizer Company (LIFECO) operate two ammonia plants in Libya with a combined annual capacity of 900,000 tonnes of urea and 150,000 tonnes of merchant ammonia. Political unrest and other related external interference have meant both the ammonia plants suffered several interruptions in the past, while many experienced operators have also left the plant. Thus restarting the plant after extensive outages was a challenge. This paper will share how the catalyst provider and operators worked together to restart the plant.

Prasanth Kumar, Clariant

17:00 Extending molecular sieve dryers service life in ammonia plants: Protecting the ammonia synthesis loop
Molecular sieve dryers are used for synthesis gas dehydration in ammonia plants synthesis loop. Any abnormal situation or operational problems for these dryers affects the reliable operation of the ammonia synthesis loop. This paper discusses causes that commonly go unnoticed during operation and are not always considered during troubleshooting. Design, installation and operational considerations to help extend the life and performance of molecular sieve dryers are shared.

S.Sajjad Hosseininia; Alireza Orooji; Reza Jafari, Pardis Petrochemical Company

17:30 Poisoning of the pre-reformer catalyst
A new pre-reformer catalyst was applied in an ammonia plant, with a guaranteed life-span of three years, but experienced early deactivation. An extensive study was done, along with spent catalyst microscopic analysis to establish root cause of early poisoning. This paper entails the reasons of pre-reformer fast deactivation and counter measures to avoid it.

Arshad Naveed, Engro Fertilizers Ltd.

18:00 Close of day three

18:00 Drinks reception sponsored by

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For more information, or to book your place, visit: www.nitrogensyngas.com

Thursday 7 March  Stream A: Ammonia, methanol and syngas

09:00 Improving the efficiency of three ammonia-urea complexes for IFFCO
Energy efficiency is key to profitability. The energy efficiency of a fertilizer complex depends on all its units and the way they are integrated. The paper describes the energy optimisation of three Indian ammonia-urea complexes and illustrates the results achieved by the relevant process units. Challenges and details of the project will be shared.

Damiano Marzari Chiesa, Casale SA

09:30 Successful hand-over of PhosAgro ammonia project in Russia
This paper details the successful commissioning of a 2200 MTPD ammonia plant in Russia. The plant was commissioned in 2017 and has achieved nameplate capacity with reduced natural gas consumption. Unique features of the project, including an in-depth look at the energy efficiency and winterisation, philosophy will be shared.

Tsukasa Otani, Mitsubishi Heavy Industries Engineering Ltd.
Svend Erik Nielsen, Haldor Topsoe A/S

10:00 Impact of convection coils performance on ammonia plant energy consumption
The performance of the convection bank for an ammonia plant represents a bottleneck in the total performance and energy consumption of a plant. This paper discusses the results of an energy assessment to improve the efficiency of the coils, reduce HP steam and fuel gas consumption, and ensure high plant productivity. Best practice techniques for cleaning procedures of the coils will also be shared.

Ahmed Soliman, Ahmed Ghazaly, MOPCO

10:30 Refreshment break

11:00 Temperature fluctuations in down-fired reformer furnaces
Down-fired reformers can experience operational problems evidenced by large swings in reformed gas outlet and tunnel exit flue gas temperatures. The result can be catalyst tube and outlet pigtail failures, leading to unplanned shutdowns. This paper will present the results into a number of studies into the causes of these temperature swings and the actions required to correct the problems.

Joe Price; Dan Barnett, BD Energy Systems

11:30 Balancing production and reliability in a steam reformer
The steam reformer ranks highly in plant risk assessments, due to complex damage mechanisms and consequences of failure. However, the risk associated with the reformer is highly dependent on its operation. This paper describes an engineering methodology for understanding risk, particularly in catalyst tubes, and making decisions regarding operation. A successful case study of a reformer unit optimised by iterative inspection and engineering will be shared.

Dan Drabble, Quest Integrity

12:00 An innovative internal and external 360 degree reformer tube inspection technology
Reformer tubes are exposed to extreme operating conditions and are susceptible to various degeneration mechanisms. In this paper, damage mechanisms affecting the complete 360° circumference of the reformer tube wall will be discussed, as well as a new method for detecting this damage around the complete circumference.

Thomas Fortinberry; Jerry Adams, Reformer Services

12:30 Reduce stress and increase throughput of reformer tubes
Fouling from different sources will cause poor design or operation of reformer tubes which can lead to premature tube failure. Application of regular cleaning procedures, according to appropriate analysis, can improve the technical conditions of the tubes, increasing the safety margin and extending the predicted average lifetimes. This paper will share case studies demonstrating the financial and energy savings benefits that an operator can realise when applying proprietary cleaning technology to their primary reformer tubes.

Peter Richter, IKR Richter Technology

13:00 Lunch and close
Wednesday 6 March

**Stream B: Urea, nitrates and finished fertilizers**

**08:00**

**Registration open** sponsored by [TOTO](#)

**Exhibition open**

**Auditorium** Sponsored by [CASALE CLARIANT](#)

**IMPROVING PRODUCTION ECONOMICS FOR UREA PLANTS**

**09:00**

Efficiency and efficacy through simplicity in urea plants

The ability to achieve product quality, environmental compliance, and easy maintenance are primary objectives for fertilizer producers to remain competitive while meeting sustainability requirements. Ensuring reliable solutions for materials and equipment will allow the attainment of long life, while meeting product quality and emission control goals. This paper describes how this approach has been developed, and enhanced, through the application of new simple and reliable novelties.

Alessandro Gianazza, Saipem

**09:30**

How to enhance the profit of urea complex by a smooth integration with the Euromel® melamine plant

Producing melamine is an opportunity for a fertilizer complex to generate higher profits and, at the same time, to hedge the seasonal fluctuations of the urea market. This paper will demonstrate how the Euromel® melamine process can be run in either an ammonia or urea plant, and will detail features of the process including: easy integration, total-zero-pollution, low energy consumption, and high reliability.

Giuseppe Di Ruocco, Eurotecnica Contractors & Engineers SpA

**10:00**

Raman spectroscopy: The innovative and reliable solution for online urea process control and analysis

In the majority of urea plants, the composition of process stream in the high-pressure synthesis is determined through laboratory analysis in terms of NH₃%, CO₂% and Urea %. However, there are a number of drawbacks in current sampling techniques. This paper will describe the features of a new online analyser based on Raman spectroscopy, that is designed to measure the full composition and the most important Key Performance Indicators of the synthesis.

Luca Rugnone, Casale Group
Carsten Uerpmann, Kaiser Optical Systems SARL

**10:30** Refreshment break

**11:00**

**INCREASING PRODUCTION AND PROFITABILITY OF NITRIC ACID AND AMMONIUM NITRATE PLANTS (I)**

NIIK’s experience in expanding nitric acid production through the construction of two single-pressure units

This paper will detail the design improvements of two single-pressure nitric acid units to enhance total capacity by 10-12%, decrease natural gas consumption by 10-12 m³/t, ammonia consumption by 3-4 kg/t, and reduce air emissions. Details of the design parameters will be shared.

Rinat Anderzhanov, NIIK (R&D Institute of Urea)

**11:30**

Contaminants and their effect on catalytic gauze performance in nitric acid plants

Nitric acid is produced by the catalytic combustion of ammonia on precious metal gauzes according to the Ostwald process. Impurities and contamination of the catalyst gauze system can result in reduced efficiency and shortened campaigns. This paper will show the different sources of impurities and will describe the influence on process performance. Several preventative solutions will be explored that can help to minimise the amount of contamination on the gauze surface.

Oliver Henkes, Heraeus

**12:00**

Platinum Group Metals are your friends: Increasing productivity while reducing cost in nitric acid plants

Increasing plant output is usually associated with an increased use of platinum, and the acceptance of higher losses at the catalyst level. This presentation will discuss possibilities of increasing productivity while keeping a close eye on the precious metals employed. It will show that metals are lost and how these losses can be minimised. It will also deal with accounting requirements related to precious metals, and best practices for metal accounting at a plant level.

Bodo Albrecht; Alan Heywood, Sabin Metal Corporation

**12:30** Lunch

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NEW DEVELOPMENTS IN UREA PRODUCTION

14:00 MicroMist™ Venturi Scrubber application at Koch Fertilizer
Worldwide, fine particulate emission regulations are becoming increasingly strict. This paper will detail the application of new high-efficiency scrubbing technology, designed to remove submicron dust and ammonia gas at extremely high efficiencies being capable of meeting the most stringent emission levels. The technology has been deployed at the KOCH Enid facility and this case study will detail the project realisation and results.
Elisa Puci, Stamicarbon

14:30 Modernisation of the CO2 centrifugal compressor in urea production
The CO2 centrifugal compressor has a defining role in urea production. Modernisation of the compressor can allow for significant capacity increases. This paper details the modernisation of the CO2 compressor to raise capacity from 950 to 1300 tons of urea per day. Examples from a modernisation project for PJSC Acron, which increased capacity by 25% and efficiency by 15% will be shared.
Aleksandr Liubimov, Entechmach

15:00 Strategic material selection and proactive corrosion prevention in urea plants
This paper reviews potential corrosion modes which may occur on various sections of urea plants, as well as the synthesis section, and also presents preventive measures against corrosion, including online corrosion monitoring technology which has been applied to a commercial urea plant.
Sho Kubota; Masashi Takahashi; Qingxin Tang, Toyo Engineering Corporation

16:00 The operation of a high-temperature pan granulator in an AN/CAN fertilizer production plant: 35 years of lessons learned
The case study focuses on an AN/CAN plant installed in 1982 with a capacity of 600MTN/D of AN grade or 800TN/D of CAN grade fertilizer. The production plant is fed by AN solution 99.5%. The initial installed HTPG and the additional related equipment were extensively modified from the first installation. The paper will explore the advantages and disadvantages of a pan granulator vs drum granulators.
Theodora Kouloura; Evaggelos Petkos, New Karvali Fertilizers S.A.

16:25 Innovations in Stamicarbon’s granulation design, from conventional fluid bed to multi-functional product diversification
This paper charts the evolution of the fluid bed granulation technology and its benefits, including increased capacity alongside reduced capex, opex and footprint. Special focus will be given to the newest expansion of the technology: a multi-functional granulation design that is able to produce specialty products such as UAS, in addition to urea. The new technology can be applied to existing, as well as greenfield, plants.
Branislav Manic, Stamicarbon

16:50 The value of enhanced efficiency fertilizer to the end user
While urea is a popular nitrogen source, as much as 50 percent of the nitrogen applied can be lost to the environment. One way for growers to protect against N loss is to utilise an enhanced efficiency fertilizer (EEF). These products can include treating urea with a urease inhibitor or using a nitrification inhibitor, designed to protect nitrogen from loss and be readily available for plant uptake. Using case studies, the paper will address key details of EEF and the associated environmental and economic benefits.
Chris Muehling; Dan Kuttenkuler, Koch Agronomic Services

17:15 An investigation on the effect of capacity reduction procedure of the urea melt section during granule section flushing
This paper will present the results of studies to optimise the capacity reduction procedure of the urea melt section to avoid impact on the granulator. The associated recommendations have resulted in higher annual urea production, safe zone for liquid level of the urea storage tank, and longer operational duration of the granulator.
M Mahdi Abadi; Behzad Hashemi, Kermanshah Petrochemical Industries Complex

18:00 Close of day three

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Thursday 7 March Stream B: Urea, nitrates and finished fertilizers

Auditorium sponsored by CASALE CLARIANT

INCREASING PRODUCTION AND PROFITABILITY OF NITRIC ACID AND AMMONIUM NITRATE PLANTS (II)

09:00 Stamicarbon’s dual pressure nitric acid technology with high energy recovery
This paper introduces a new dual pressure nitric acid process, which has a single-train capacity range of 600 – 1600 tpd. The new technology promises high energy recovery via a high tail gas temperature feature which will be detailed in the presentation.
Paz Munoz, Stamicarbon

09:30 Increasing the capacity of ammonium nitrate plants
This paper will highlight the latest revamping developments to increase capacity and reduce emissions for ammonium nitrate plants. The paper will feature examples of recent projects including Neochim, Uralchem and Dorogobuzh.
Alexandr Vasilyev, ALVIGO/GIAP

10:00 Presentation to be confirmed

10:30 Refreshment break sponsored by Henkel

OPERATIONAL CASE STUDIES, INCIDENT ANALYSIS AND SAFETY

11:00 Fertilizer industry operational risks database
This paper will introduce a new programme that will monitor known risks, evaluate the effectiveness of deployed mitigations, and detect emerging risks in fertilizer plants. This programme relies on various data and information sources across the fertilizer industry, including anonymously de-identified data provided by operators. Potential benefits of the tool on process safety and operational excellence will be shared.
Dan Cojocaru, AmmoniaKnowHow.com

11:30 The AXO Welding and GPIC partnership: A benchmark in realising high safety standards and high on-stream figures
This paper will share the benchmark safety standards and high on-stream figures that have been developed through the application of a risk-based maintenance system. Risk assessment, mitigation measures, and turnaround activities will be detailed.
Mauro Orsini, Axo Welding
Abdulmunem Alnajjar; NaderAbdulrahim, GPIC

12:00 Practical solutions to challenges encountered and experience sharing for multiple dry gas seal failures
This paper will share the experience of multiple failures of the dry gas seal system within a urea plant. The reasons for failure, subsequent problems, and practical solutions will be shared. The modifications, procedural changes, and inspection plans employed after the event, will be detailed.
Muhammad Amir Abdullah; Arslan Tahir; Bilal Mustafa; Usman Asif; Rohail Hussain Khilji; Azhar Rasool, Engro Fertilizer

12:30 Case study: Emergency shutdown due to HP line rupture and subsequent leakage; lessons learned
The paper highlights a critical leak incident that occurred in a high-pressure pipe line in urea plant, which resulted in an emergency shutdown and losses in production. How the situation was analysed to prevent re-occurrence and similar incidents, and the root cause analysis, will be shared.
Mohamed Mostafa Shams, Misr Fertilizers Production Co. (MOPCO)

13:00 Lunch and close

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- Flow meters
- Heat exchangers
- HP machinery and equipment
- Mist eliminators
- Pressure vessels
- Reformer catalyst tubes
- Refractory materials
- Screening equipment

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<td>Until 25 January 2019</td>
<td>€1,575</td>
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<td>€1,700</td>
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Muhammad Asad Waheed, Maintenance Manager, Engro Fertilizers Limited

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