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SOGAT

29-30 September 2020

Virtual Conference & Exhibition

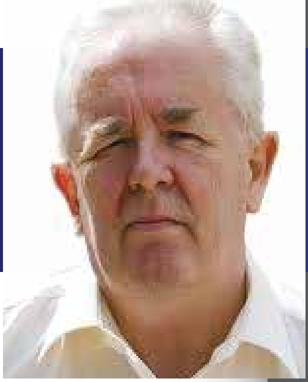
PROGRAMME-SPEAKERS

SOGAT VIRTUAL CONFERENCE

SOGAT 2020 VIRTUAL CONFERENCE AGENDA (SEPTEMBER 29 - 30)

DAY 1

SEPTEMBER-29



WELCOME ADDRESS
NICK COLES
SOGAT

Dr Nick Coles concluded his academic period as the Engelhard Research Fellow having received D.Phil from Oxford University , his Master's Degree in X-ray Crystallography were research was conducted in part at Cambridge University following a 1st class Honours Degree in Materials Science . He has been organizing technical events around the globe for many years beginning with developing the conference programme at the British Hydromechanics Group. He was one of the founders of INFORMA who are now one of the world's largest event companies. He came to the UAE in 1994 at the request of a number of international instrumentation companies to create a SCADA oil and gas event with ADNOC support. Since then has been working on developing relevant energy events that address issues of concern in digitization , cyber security and gas conditioning on behalf of DOME Exhibitions .

SOGAT was initiated from a series of training seminars on Sulphur Recovery and Acid Gas Treatment conducted in the region with the first SOGAT event occurring in 2004. It has been held every year since during which time it has been supported by no less than 60 leading organisations worldwide .

SESSION A - MODERATOR
THOMAS CHOW
FLUOR

Thomas Chow is currently serving as Vice President of Fluor's Global Sulfur Technology Group. He is responsible for business development, project execution and sulfur technology development for Fluor. He holds a Bachelor's Degree in Chemical Engineering from University of Wisconsin, Madison, and a Master Degree in Chemical Engineering from Stanford University. His PhD Research was in the field of Catalysis. He has 46 years of experience in Sulfur Recovery Technology, Oil & Gas, Refining and Petro Chemical industries. He is known in the industry with numerous technical paper publications and a holder of 9 sulfur technology patents & 2 pending patents. He is a pioneer of Oxygen Enrichment Technology -- A technology being used in many sulfur facilities around the global for processing capacity expansion to date. He had served as a member of the Board of Directors of the renowned Alberta Sulfur Research Limited (ASRL) for 8 years. He currently also serves as a member of the Advisory Committee of the renowned Laurance Reid Gas Conditioning Conference (LRGCC); CRU (British Sulfur) Conference, Brimstone Engineering Sulfur Conference and the SOGAT Conference.

A1

OVERCOME SRU'S REVAMP WITH SPECIAL FEATURES OF 2- STAGE SWS VS O2 ENRICHMENT FOR TANGIBLE BENEFITS,

MAHIN RAMESHNI, RATE

In recent years it is more demands for the modifications or the modernisation and revamp of existing sulphur plants where marginal investment has resulted in significant benefits. We can categorize the nature of these revamps or modernisation for the purpose of improvements of these units and we reported numbers of papers to cover these scenarios from executing these revamp or modifications projects. The merit of modification or modernisation of each application would depend on the purpose of the work and the benefit can be justified. General speaking, it is also known that in most cases modifications or modernization of the existing units will requires less capital costs and less investments compare to building new units.

However, it is essential to mention that depending on the nature of these modifications the technical evaluation shall be conducted and based on the detailed cost estimate the benefits and saving can be compared within considered options, and some cases plot spaces limitation and the operating costs may play a major role in decision making.

We recently conducted a project for a refinery modification for the capacity expansion as well as SO2 emission reduction; where 2-stage SWS with special design features versus using oxygen
enrichment was evaluated for the capacity expansion plus different options for the tail gas modification to reduce SO2 emission was also evaluated.

In this paper, the applications and the benefits of all level of oxygen enrichment will be discussed in regard to capacity expansion, dealing with the lean acid gas for gas plants and sour gas field developments and benefits and results of CO2 reduction in the stack. RATE licenses the oxygen enrichment technologies up to 100% oxygen which the existing capacity can be doubled with a minimum modifications and small capital costs. As an alternate the new innovation process of 2-Stage Sour Water Stripper where the patented technology is equipped with a special feature to capture all of the H2S before entering the incineration resulting zero SO2 emission where the old technology was not able to achieve that. The evaluations and the results including the advantages of these options plus SO2 and CO2 emission reductions and the cost comparison will be discussed.

MAHIN RAMESHNI
RATE

Mahin Rameshni, P.E. is the President and CEO of RATE Engineering Technology Group in the USA for nearly 10 years. Before that, she was Vice President and Global Manager of Sulphur Technology and Gas Processing of WorleyParsons for about 14 years where she was awarded "Grill Award" as the Global best employee of the year for her achievements and dedications and leadership. She has more than 30 years experience in sulphur technology and gas processing.

She has been focusing on technology offering and technology development and improvement of the sulphur recovery and technologies and also "Zero Emission", and "ACT" Advanced Clean Technologies, where she has about 20 patents granted by USA Patent Office and several pending. She has more than 100 papers and publications, presented worldwide in sulphur conferences regarding total sulphur management and technology and emission control and clean technologies.

A2

SMART SRU'S PRE-INVESTMENT UTILIZING O2 ENRICHMENT TECHNOLOGY REDUCED THE NUMBER OF REQUIRED SRU'S FOR A GREENFIELD GAS PROCESSING FACILITY,

MAHER ABDULATTIF , SAUDI ARAMCO

This paper presents an unparalleled engineering assessment conducted to evaluate the feasibility of pre-investing in O2 enrichment technology, to increase the processing capacities of conventional air-based sulfur recovery units (SRUs). The goal is to minimize the overall number of required SRUs for a greenfield gas plant, and consequently, capture a significant cost-avoidance opportunity.

The assessment started with O2 enrichment technology review, including: basic principle verification, impact of different O2 levels on units' throughput, equipment sizing philosophy, HSE considerations, and concluded with a high-level economic analysis.

The technology review revealed that a high-level O2 enrichment can more than double the processing capacity of air-based SRU, depending on the H2S content in acid gas; so as the H2S% in feed increases, the debottlenecking capability increases. For the project under assessment, the processing capacity of air-based SRUs showed a maximum increase of 80%. Moreover, operating with high O2 levels, will elevate SRU reaction furnace temperature, and mandates installing high-intensity burners, along with special control and ESD functions, to manage potential risk and ensure safe operation. Additionally, the liquid holding section of SRUs (condensers, collection vessels, degassing vessels, sulfur storage tanks) can be enlarged to account for more sulfur production. Typically, the enriched oxygen can be supplied from air separation units (ASUs), which entails significant capital cost.

Apart from these special design considerations, there are several advantages for adopting this technology, such as higher sulfur recovery in Claus plants, which will reduce the load on TGTUs, higher HP steam production, less fuel gas consumption, lower air-preheaters' duties, and lower capital cost for new plants. Conventionally, O2 enrichment technology is used to retrofit operating SRUs facilities; however, it is unique to consider O2 enrichment-design requirements as part of new air-based SRUs design (phase I), to enable smooth transition to fully O2 enrichment operated SRUs at a later phase of the project (Phase II: four to five years later) without the need for any design modification. This exceptional pre-investment strategy has resulted into reducing the required number of SRUs at phase

MAHER ABDULATTIF
SAUDI ARAMCO

Maher Alabdullatif, Sr. Operations Engineer working at Saudi Aramco and has 15 years of experience in gas processing. He covered several technical and management positions along with different business portfolios. Maher has recently joined Saudi Aramco Unconventional Resources Program and was part of a mega project team for developing a grass root gas processing facility.

A3

A MORE ECONOMICAL WAY TO PROCESS AMMONIA

RUBEN KRANENBURG, DUIKER COMBUSTION ENGINEERING

Duiker has developed its Stoichiometric ally Controlled Oxidation unit (SCO unit) to meet the demand in the market for a simple and reliable process to handle ammonia in the industry. The unit converts ammonia to nitrogen and water so that it can be safely emitted to the atmosphere.

Today we have a number of these units in operation under various process conditions which prove its ability to completely decompose NH3, while NOx emissions from the unit can easily meet environmental regulations without further treatment. This forms a clear contrast with uncontrolled ammonia combustion which can easily generate thousands of PPM of NOx emissions. The SCO unit can realize NOx emission in the range of 50-70 ppm @ 3%O2dry.

The unit has been integrated in various commercial plants, where under existing plants and new grass roots facilities. In refineries the SCO unit has been integrated in SRU plants to debottleneck existing facilities so that more Sulphur can be handled and in new grass-roots plants due to the favorable economics of this line up.

Although the main purpose of the unit is to handle ammonia, most of the units have an integrated thermal oxidizer zone to treat the tail gases from the SRU upstream as well. In this configuration the heat generated during the oxidation of NH3 is reused in the down-stream thermal incinerator unit to preheat the SRU tail gases and to reduce the quantity of fuel gas that is needed in the thermal oxidizer section.

Currently research is being carried out to investigate what the effect is of greater amounts of Sulphur on the operation of the SCO unit. For instance when SWS would be directly processed by the SCO unit and how this affects the decomposition of ammonia. The expectations are promising which practically means that larger amounts of Sulphur can be processed by the SCO which can make it an attractive alternative for directly processing gases from a single stage SWS unit. Furthermore we see potential for realizing even lower NOx emission values.

RUBEN KRANENBURG
DUIKER COMBUSTION ENGINEERING

Ruben Kranenburg, BA
Ruben Kranenburg graduated from the Utrecht University of Natural Sciences with a Bachelor's degree of Mechanical Engineering. He joined Duiker Combustion Engineers as a sales engineer in 2007 where he worked on the technical design and budgeting for a wide range of projects in the Middle East where under the Habshan and Wasit projects. After two years he was promoted to area sales manager in which position he is responsible for business development in the Middle East and Asia. Specialty projects he has worked on for Duiker Combustion Engineers include: alternative methods to process sour water stripper gas, oxygen applications and upgrading projects of existing SRU equipment. In 2018 he was raised to the position of Sales Manager in which he is responsible for the global sales. In addition to his role as a manager he currently spends most of his time with his family as a father of three young kids leaving no time for further hobbies.

A4

AMMONIA DESTRUCTION IN THE THERMAL SECTION OF SULFUR RECOVERY UNITS

ABHIJEET RAJ GUPTA , KUST

Ammonia and aromatics such as benzene, toluene, and xylene (BTX) are typically found in acid gas and sour water stripper gas in oil and gas processing plants and gasification facilities. This gas is often processed in sulfur recovery units (SRU) to recover marketable sulfur and thermal energy. Ammonia must be completely oxidized at high temperatures in the furnace to prevent the plugging of catalytic reactors and the corrosion of downstream equipment in the SRU. A detailed reaction mechanism is presented to capture the chemistry of ammonia destruction in the presence of several chemically active species of acid gas combustion in the thermal section of SRU. The mechanism is validated with different sets of experimental data from lab-scale and industrial plant studies. The reaction mechanism is utilized to simulate the furnace and the waste heat boiler (WHB) of SRU in Chemkin Pro software. Through the furnace and WHB simulations, the most suitable operating conditions of the furnace that could lead to an effective destruction of ammonia in the furnace is investigated, and the dominant reaction pathways involved in the oxidation process are identified. With increasing feed temperature and oxygen concentration in air, the ammonia concentration was found to decrease substantially down to the acceptable limit of <150 ppm at the exit of SRU's thermal section. The decrease in NH3 occurred due to its enhanced oxidation by several oxidants (OH, SO, and O2) at high temperatures above 1300 oC, though it also led to a decrease in sulfur recovery efficiency and an increase in CO production at the thermal section's exit. This indicates the need for optimized furnace parameters that could lead to a reasonable trade-off between ammonia destruction and CO emissions from the SRU. The developed reaction mechanism provides a means to obtain optimized SRU parameters to achieve ammonia destruction, enhanced catalyst life, and reduced emission of harmful gases (CO and SO2).

ABHIJEET RAJ GUPTA
KUST

Abhijeet Raj is an Associate Professor of Chemical Engineering at Khalifa University in Abu Dhabi, UAE. He received his PhD degree from Cambridge University, UK in 2010 and Bachelors degree from Indian Institute of Technology Guwahati, India in 2006. His current research activities involve the development of reaction mechanism for H_2S-rich acid gas, process modelling and optimization of sulfur recovery units for high sulfur recovery, feed contaminant destruction, and operating cost reduction, and experimental studies on fuel combustion.

SESSION B - MODERATOR –
RICHARD HANDS
SULPHUR MAGAZINE

Richard Hands has been the editor of Sulphur magazine since 2009. A chemist by training, he has been involved in technical publishing for 25 years, most recently as a partner in BCInsight Ltd.

B1

SULPHUR DUST – CAN IT BE PREVENTED ,

HANY EL GHERIANI , ENERSUL LIMITED PARTNERSHIP

Dealing with sulphur dust has become a key discussion topic in the region over the past few years. This is due to the fact that the Middle East region has become the leading producer of solid sulphur in the world. This has brought about operating and safety challenges for various facilities that were not used to operating sulphur solidification plants and loading terminals at these high production capacities. Add to that an increased travel distance and new transportation methods, and it gets even more complicated. In this presentation, I will discuss whether or not sulphur dust can be prevented and how operating companies can deal with it to protect its 3 P's; people, planet and profits.

HANY EL GHERIANI
ENERSUL LIMITED PARTNERSHIP

Hany El Gheriani is the Director of Middle East Operations for Enersul Limited Partnership, one of the leading suppliers and operators of sulphur forming and handling equipment. Hany has been with Enersul for about 10 years and has held various positions in engineering, project management and business development. He has been involved in various sulphur dust studies conducted in the UAE, Saudi Arabia, Turkey and Morocco. Prior to joining Enersul, Hany worked for Fluor Canada on various FEED and detailed engineering projects. He currently resides in the UAE and holds a B.Sc. in Electrical Engineering and M.Sc. in Chemical Engineering from Queen's University and an MBA from the Haskayne School of Business at the University of Calgary. Hany is also a registered Professional Engineer in the Province of Alberta, Canada.

B2 REAL TIME H2S ANALYSIS – UAE CASE STUDY

ALI MONCUR , SMS

ADNOC, mobilised a Real-Time Inline H2S Analyser to monitor concentration of H2S in the produced gas phase in realtime without the need for manual sampling and its associated risks.

Challenge:

HSE - To reduce the risk to personnel from both potentially harmful gas exposure and utilising breathing apparatus in ambient temperatures above 40°c Realtime Representative Data – Data was to be available realtime to the client onsite offshore and onshore to allow fast dynamic decision making.

Solution:

The Real-time Inline H2S Monitoring System was mobilised and installed via existing sampling points with the system setup as a closed loop, minimising potentially lethal gas emissions and provided online/real-time data for the customer. Concentrations of upto 50% H2S can be measured, without the need for personnel to be tasked with taking manual samples.

Results:

Successful H2S real-time analysis conducted, monitoring concentrations upto 30%, without the need for personnel to take manual samples onsite. Throughout all phases of the operation, continuous H2S readings of gas stream were taken and the results made available onsite, remotely and via the well test acquisition system.

Value to Client:

Reduced Risk to Personnel

- Reduced potential exposure to harmful gases in high toxic gas producing wells and fields
- Reduced risk to personnel using breathing apparatus in ambient temperatures above 40°c

Reduced Costs

- Reduced requirement for personnel to be tasked with taking samples and performing lab test

Realtime data

- Immediate reliable online H_2S data available remotely, allowing dynamic and timely decision making for the client

ALISTAIR MONCUR
SMS OILFIELD

Over 20 years' Oil & Gas industry experience from International field engineer through to Technical Director, supporting E&P Operators and Multinational service companies in Europe, SE Asia and laterally in Middle East, having moved to Abu Dhabi 3 years ago.

Alistair is responsible for SMS' R&D and Innovation strategy, having been awarded patents for technology developments that have been successfully imbedded at the core of the business, driving a strategy that enables innovation with cross sector application, including Oil and Gas, Renewables and Marine industries.

B3

IMPROVE EFFICIENCY OF GAS SWEETENING UNITS

PRASANTH SREEKUMAR , ENDRESS & HAUSER

Amine sweetening unit uses liquid desiccants (aqueous solution of one of the alkanolamines) which reacts with weak acids in raw natural gas to form weak organic salt complexes. Gas sweetening process involves removal of acid gases like H2S and CO2. Acid gases forms corrosive acids in the presence of water resulting in corrosion of the process units and pipeline. Acid gases reduce heating value of the natural gas and hence important to maintain the specifications stated by the pipeline company.

One of the key efficiency criteria for gas sweetening unit is how well the contaminants are removed and the quality specification of the sweet gas is achieved. Processing unit involves contactor, regenerator, heat exchangers, separators and re-boiler. The degree of acid gases removed depends on process variables like inlet gas temperature, inlet gas pressure, gas flow rate, inlet amine temperature, amine concentration and amine circulation rate.

It is critical to accurately monitor and control the process parameters to minimize challenges associated with the process. Process control instrumentation plays a major role in achieving efficiency of operation by providing real-time accurate information of valuable process data thereby improving process efficiency and optimizing the process. In summary, if you can't measure you can't improve. State of the art new generation electronic flow, level, temperature and pressure transmitters enable you to accurately measure under challenging and varying process conditions and thereby improve efficiency of your process.

PRASANTH SREEKUMAR
ENDRESS & HAUSER

Prasanth Sreekumar is the Global Industry Development Manager- Natural Gas working in the corporate marketing team. He has over 20+ years' experience in the field of process control instrumentation. In his current role, he is responsible for the development of gas and LNG topics, works closely with various stake holders in the natural gas value chain. He is also involved in portfolio development within the company and work with production facilities to develop new products and solutions.

In the past he has held various positions in sales, marketing and industry development. He is also a member of the Endress+Hauser strategic industry group who is developing and driving strategies within the group

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DAY 2

SEPTEMBER-30

SESSION C - MODERATOR - MOHAMMAD AL HAJI SAUDI ARAMCO

Mohammed is an engineering consultant with Saudi Aramco. Accumulated more than 28 years of working experience in the area of gas processing. Throughout his career with Saudi Aramco, Mohammad worked as process engineer in several gas plants. He also played key roles during the design of major gas plants built by Saudi Aramco in the past 21 years. He currently works with the process and controls system depart part of the company's central engineering to provide technical support operating facilities as well as introducing new technologies. The main area of expertise is Gas Sweetening and Sulfur Recovery. Mohammed graduated from King Fahd University of Petroleum and Minerals (Dhahran, Saudi Arabia) with BS degree in chemical engineering in 1992.

C1

WASTE HEAT BOILER FERRULE FAILURE SYMPTON OF STEAM / WATER SIDE ISSUES

ELMO NASATO , NASATO CONSULTING

Evaluation of Waste Heat Boiler (WHB) ferrule failures is generally focused on the process side of the WHB but the water/steam side is frequently neglected in both the fine details in the conceptual design and in the normal day-to-day operation. However, the water/steam shellside frequently provides harsh reminders of the importance of keen attention in order to insure reliable, safe and high on-line operation of the WHB. The purpose of this paper is to identify the key design and operating considerations for the shellside of an WHB with the primary intention of raising the awareness of its importance.

ELMO NASATO
NASATO CONSULTING

Elmo Nasato is a process engineer specializing in sulphur recovery, amine treating and sour water processing. He has over 30 years experience in the sulphur recovery industry including experience with design, retrofit, start-up and optimization of sulphur recovery units, sulphur handling units, amine units, sour water stripper units, and tail gas cleanup units. On-site field activities have included support of construction activities, turnaround assistance and Operator training. Elmo graduated from the University of Waterloo, Ontario, Canada with a B.A.Sc. Chemical Engineering (1987) with an option in Management Science. He currently is the lead instructor and moderator for the Brimstone Vail Sulfur Recovery Symposium and has served on the Board of Directors for Alberta Sulphur Research and the Technical Advisory Committee for the Laurance Reid Gas Conditioning Conference. He has been awarded eight patents for SRU operation, oxygen enrichment and sulphur degassing technologies, has published 37 papers and has made over 66 presentations at conferences worldwide

C2

A NOVEL ADSORPTION-BASED TAIL GAS TREATMENT TECHNOLOGY

GEORGIOS LITHOXOOS , SAUDI ARAMCO

Strict environmental regulations are in place worldwide to limit the emission of sulfur dioxide (SO2) from sulfur recovery units. Considering the current high cost of the tail gas treating technology options, alternative solutions keep on appearing in the literature and market. In this study, experimental and computational data are discussed for a novel two-stage adsorption process for Claus tail gas treatment. The purpose of this process is to separate and capture hydrogen sulfide (H2S) from the tail gas mixture and recycle it to the Claus feed gas. In the first adsorption stage, water is removed from the tail gas mixture using beds that contain hydrophilic molecular sieves while the rest of the tail gas components pass through the beds toward the second adsorption stage. The stream that exits from the first adsorption stage is guided to the adsorbent vessels of the second stage, which are filled with ion exchanged zeolite such as CuY. Carbon dioxide (CO2) and nitrogen (N2) pass through the vessels while hydrogen sulfide is captured. When the second stage vessels are regenerated, the exiting gas stream is guided toward the Claus unit feed gas

GEORGIOS LITHOXOOS
SAUDI ARAMCO

Dr. Georgios Lithoxoos joined Saudi Aramco Research & Development Center (R&DC) in Dhahran in 2014. Before joining Saudi Aramco, Georgios worked as an Associate Researcher at National Center for Scientific Research 'Demokritos' (NCSR), Athens, Greece

Georgios holds a PhD degree in Chemistry from University of Athens obtained in 2009. His thesis focused on "Theoretical – computational investigation of the adsorption of molecular fluids in carbon and silicon nanoporous materials".

At Saudi Aramco, Georgios led molecular modeling activities related to gas treatment, involving Grand Canonical Ensemble Monte Carlo simulations and adsorption processes mathematical modeling. He also led the development of new technologies for Sulfur Recovery Units upgrading. In addition, he is mentoring young scientists in the fields of molecular modeling and experimental adsorption.Dr. Lithoxoos co-authored five publications in peer-reviewed journals. He is the co-inventor of one granted and several filed US patents.

C3

METHODOLOGIES FOR ACHIEVING AN OPTIMIZED TEMPERATURE PROFILE IN THE SRU REACTION FURNACE AND THERMAL OXIDIZER

UDAY N. PAREKH , BLASCH PRECISION CERAMICS

The Reaction Furnace (RF) in a Sulphur Recovery Unit (SRU) poses the greatest design and operational challenges due to its complex role, both as the dominant equipment in the conversion of H2S to sulphur, as well as its critical role in the processing and destruction of hydrocarbons, ammonia and Benzene, Toluene, Ethylbenzene and Xylene (BTEX) that are generally present in the process gases fed to the SRU with the specific species dependent on whether the SRU is in a refinery or a gas plant. Keen attention must be paid to the basic "3 Ts" of combustion – time, temperature and turbulence – in the SRU RF for effectively executing these roles and ensuring trouble-free downstream operation. These same "3Ts" are also of critical importance in the design and operation of the SRU Thermal Oxidizer (TOX) to ensure the required carbon monoxide destruction while minimizing fuel gas usage and carbon dioxide emissions.

This paper will focus on the various methodologies that are in practice today to optimize the combustion in the reaction furnace and TOX with the main objectives of achieving the desired temperature for contaminant destruction in the RF (especially for lean process gases) and desired CO specs in the TOX. Predominant among these methodologies are fuel gas co-firing, combustion air and process gas preheating, oxygen enrichment, high intensity burners, and the deployment of appropriately configured RF and TOX internals that enhance front zone temperatures while in some instances also improving mixing and providing a tighter residence time distribution.

All the above-mentioned methods for increasing RF and TOX front zone temperature have their pros and cons in terms of their technical efficacy, capital and operating costs, maintenance implications, CO2 release and ease of operability. For example, fuel gas co-firing significantly reduces the capacity of the SRU (1 mole of natural gas adds almost 11 moles of process gas to the SRU), while oxygen enrichment has the opposite effect with the removal of significant quantities of nitrogen from the flow load but carrying the burden of higher operating costs. Burner design and furnace internals are often linked, with the two having a symbiotic relationship in the calibration of the "3Ts" through the length of a combustion chamber. The paper will provide operating data from various installations as well as the results of rigorous CFD modelling to compare these various methodologies and quantify their advantages/ disadvantages for achieving optimized SRU reaction furnace and thermal oxidizer performance.

The novel and first of its kind recent deployment of proprietary internals at sour gas plants in the Middle East in SRU Thermal Oxidizers to enhance carbon monoxide destruction while reducing energy consumption and GHG emissions will also be a key feature of the paper.

UDAY N. PAREKH
BLASCH PRECISION CERAMICS

Mr. Uday N. Parekh is Senior Global Director, Energy and Chemicals at Blasch Precision Ceramics. He is responsible for deployment of Blasch's innovative products and solutions to these industries including VectorWalls and ferrules to improve reliability, plant capacity, and energy efficiency, while reducing carbon dioxide emissions. He has over 25 years of experience in the Sulphur Recovery industry and in combustion applications

Mr. Parekh was with Air Products, a leading industrial gas company, where he led refinery applications development and technical sales for several years. This included SRU oxygen enrichment that can more than double the capacity of air-based SRUs. Subsequently, he was Vice President of Sales and Marketing at Goar, Allison & Associates, Inc. (GAA) from 2008 -2012, then an Air Products subsidiary. His experience in the sulphur block extends to sulphur degassing and sulphur forming through his time at GAA and later with Devco, now Matrix PDM Engineering.

Mr. Parekh holds patents and has presented and published extensively in the industry. He has a bachelor's degree in Chemical Engineering from the Indian Institute of Technology, Bombay, master's degrees in Chemical and in Fuels Engineering from the University of Utah, and an MBA from Lehigh University in the U.S.

C4

STRATEGIES TO MINIMIZE THE COST OF THERMAL MAINTENANCE WITHOUT COMPRIMIZING PERFORMANCE

JUSTIN TUCKER , DAN CAMPBELL , CSI AMATEK

Where the process fluid must be maintained within a certain operating temperature window, the piping will likely require the application of a thermal maintenance system. Thermal maintenance systems can utilize a broad range of technologies from bare tube tracing to fully jacketed pipe. However, regardless of the technology employed, engineering must be performed to design the system. The approach used for the engineering and design of the system can have a dramatic impact on the cost. This paper presents four strategies for minimizing the total cost without compromising performance. The strategies are:

1. Match the heating technology to the application
2. Optimize the heating circuit lengths
3. Optimize the utility infrastructure
4. Structure the bid process to reward optimization

Additionally, three real-life examples are presented that demonstrate the actual savings that these strategies can achieve. These examples are:

- Example A showing the benefit of Strategies 1 and 2 combined
- Example B showing the benefit of Strategy 3
- Example C showing the benefit of Strategy 4

While much of this discussion centers around steam heating systems, the same principles apply to other heating fluids and cooling systems.

JUSTIN TUCKER
CSI AMATEK

Justin Tucker has over 7 years of experience working in the sulfur business at Controls Southeast, Inc. Currently he is based in Dubai as Middle East Sale Engineer working extensively throughout the region. He graduated with a Bachelor's Degree in Mechanical Engineering at University of North Carolina at Charlotte.

DAN CAMPBELL
CSI AMATEK

Director of Business Development – Europe/Middle East/Africa/ India for Ametek Inc. Thermal Process Management Business Unit, which CSI is a part of. Been with CSI and then Ametek Inc for last 13 years, BS in Business from Robert Morris University, MS in Engineering from University of North Carolina at Charlotte.

SESSION D – MODERATOR – SIMONA CORTESE KTI

Simona Cortese is a chemical engineer graduated at the University of Rome "La Sapienza" with over than 17 years of professional experience in Sulphur Recovery & Tail Gas Treatment. She joined KT - Kinetics Technology S.p.A. in 2003 where she is currently working as Proposal Manager for the development of technical and commercial proposal for Feasibility Studies, Basic design and FEED activities. She is also responsible as project Manager of the execution of the assigned project relevant to the core business of the KT and Research & Development of innovative technologies.

Prior to joining KT, she was process engineer stager for ENI Technology (Italy) and in the 2006 - 2007 she joined Suncor Energy Inc. (Canada-AB) as Upgrading Process Engineer leader for the pre-commissioning, commissioning and start-up of new SRU and as Deputy Process Engineer Leader during the Plant Turnaround 2007.

D1

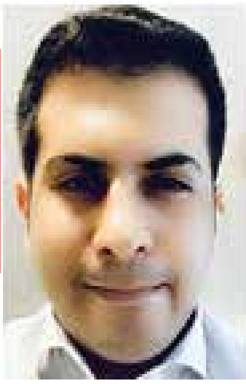
ENERGY EFFICIENT DESIGN OF INDUSTRIAL PROCESS THROUGH LIFE CYCLE COST OPTIMIZATION

SAMI AL MUTAIRI , SAUDI ARAMCO

Industrial sectors account for about one third of global energy consumption which rely on fossil fuels as the primary source of energy. A large portion of the energy consumption is spent on production of utilities for the process plants to produce energy for other sectors. Due to the impacts of fossil fuel combustion on the environment lots of effort are made to minimize it and also environmental regulations are affecting the cost of energy to produce it. Furthermore, this is competitive world and with ever increasing energy prices the industrial communities are invited to conserve energy resources.

It is common to find options for process changes in a production process and identify opportunities to reduce the operating and capital costs. Designing any system have many constraints and the challenge is to utilize the imposed constraints in a way to improve the system efficiency. Proper utilization of system design constraint along with the available technology can lead to efficient system design which provide many options for optimization. All system design is defining its efficiency by operation, the best operation can achieve/approach to the design efficiency but you cannot improve further without changing the system design. So, if a system is designed for higher efficiency will perform always superior that an inefficient designed system. Hence, it is very important to optimize the new facility design and develop methodology to investigate all possible alternatives during the design stage of the project.

In this paper, optimization of the new facility design with simultaneous process and utility integration is demonstrated by conducting energy optimization assessment for one of the upcoming facilities during DBSP phase of the project. The objective of the assessment is to optimize the project life-cycle cost by assessing and examining all technical feasible design alternatives. The new facility is installation of additional units in the existing natural gas processing plant. Natural gas processing plants require a series of process units to remove contaminants such as water, carbon dioxide and hydrogen sulfide. These units have different process heating and cooling demands. Proper matching of the heating and cooling requirements leads to significant operating cost reductions. Excessive heat from process units can be recovered which may be used for satisfying heating requirements of other units or for power generation. The purpose of the new facility is to install dew point control unit, de-ethanizer and condensate stripper to meet the required products specification. The assessment results in energy and capital savings as well as GHG reduction and also assure that the new facility design is energy efficient while satisfying all intended objectives.



SAMI AL MUTAIRI
SAUDI ARAMCO

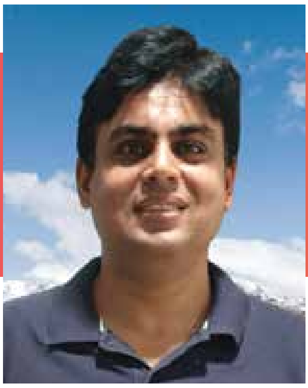
Sami Almutairi is a process engineer working in Saudi Aramco with the process and control system department, he holds a bachelor degree in Chemical engineering Since 2015 and has more than 4 years of experience, during his time he joined multiple industrial facilities including Gas processing and NGL facilities at Saudi Aramco.

D2

THERMODYNAMIC ANALYSIS OF ENERGY RECOVERY FROM PRESSURE REDUCTION STATIONS

SAQIB SAJJAD , ADDNOC GAS PROCESSING

The paper presents thermodynamic analysis of energy recovery from isentropic expansion based technologies. These technologies are regarded as an alternative to the conventional isenthalpic process based pressure reduction stations (PRS). Energy recovery technologies also generate power or mechanical work along with pressure reduction to the same level, therefore these are always deemed a better choice over pressure reduction stations. Thermodynamically, energy recovery materializes at the expense of relatively lower exit temperatures, signifying implications for the downstream processes. The paper portrays the overall energy balance of a broader system employing an isentropic expansion for energy recovery, underscoring the repercussions of relatively lower outlet temperature on energy demand of downstream units. The analysis is based on thermodynamic models, developed in a process simulation platform, for each of the energy recovery technologies being analyzed. The paper examines the thermodynamic analysis of using Back Pressure Steam Turbine (BPST) in place of steam pressure reduction station to supply low pressure steam to regenerators, and explains its impact on boilers load supplying high pressure steam. The paper also analyses the impact of replacing amine absorber level control valve with a hydraulic turbine, in a Gas Sweetening Unit, on amine regeneration and overall energy consumption.



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Mr. Saqib is a Subject Matter Expert (SME) in Industrial Energy Efficiency and is leading energy efficiency at the ADNOC Gas Processing. He has led numerous studies & initiatives and contributed in energy efficiency improvement at the operating facilities as well as in the projects. He has also contributed in developing energy policy & strategy as well as sustainability strategy, in initiating energy performance benchmarking and in developing energy competencies. He has authored numerous conference papers and presented at various national and international forums. He is actively working on Waste Heat Recovery, integration of renewable energy in the Oil & Gas Industry and on dynamic energy use cases as part of the ADNOC digitalization drive. Mr. Saqib has also supported energy efficiency in R&D.

Mr. Saqib won the year 2016 "Energy Engineer of the Year" award for the Middle East Region. In 2017, he was bestowed with the "National Excellence Award" and in 2019 Mr. Saqib won the Best Paper Award at the SOGAT Conference. His name is included in the Association of Energy Engineers (AEE) list of "Legends in Energy". With Masters in Chemical Engineering and MBA, he is also a Chartered Engineer, Certified Energy Manager and a Certified Measurement & Verification Professional.

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DOCUMENT & DATA ANARCHY IN THE WAY OF DIGITISATION ? SOLVED WITH ARTIFICIAL INTELLIGENCE

ROBERT FROW , DIGATEX

Whilst industries strive towards digitalization, the reality is documents, as opposed to data, is the way most information is stored and accessed. This is perceived to be a stumbling block in a company's path toward Digitalization. Much of this legacy information is unclassified, hard to find and often incomplete. Artificial Intelligence is the game changer enabling the cost effectively create digitally intelligent drawings, documents and models, thus enabling digital twins and the application of predictive analytics and data analytics.
Using the latest neural network technology we have developed domain supervised learning models, configured to identify key aspects of the target drawings specific to each client . We then process the drawings in batches and classify them according to these rules, and at the same time we mine the content to create a digital asset, linking together all data sources in an object centric environment.
The AI platform is configured to extract the required data. The learning process is iterative, and the accuracy and content extraction improves as more drawings and documents are processed. The recognition process has multiple levels depending on what data needs to be extracted.

ROBERT FROW
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• **Principal Consultant DIGATEX Dubai UAE** - Principal Consultant with DIGATEX Middle East – Guiding, delivering and supporting the Digital Transformation of engineering and asset information. In-depth Owner Operator and EPC experience successfully developing and implementing strategies for the alignment of IT within the Business. IT project execution, contract negotiation activities in the upstream, midstream, downstream and power sectors in all global regions.

• **Principal Consultant AVEVA Dubai UAE.** - Providing consulting services to the EPC and Owner Operator arena throughout the Middle Eastern region. Partnering with business colleagues and technology leaders identifying opportunities to apply IT or IM solutions to improve business performance.

• **Hess Corporation Houston Texas USA** – Leading a team of Engineers and IT technicians to construct the company's first Data Warehouse and drive their information management handover requirements down their supply chain.

• **CAD/CAE Support Manager – M W Kellogg** - Providing support to Kellogg's UK based capital Project. Responsible for the management of the Engineering Computer Systems Group (ECS) with overall responsibility for companywide (London based) CAD operations. 3D Modelling, Materials Management and Data Handover to clients.