



NEWS FOCUS 2001

ANNUAL NEWSLETTER OF THE GAS PROCESSORS ASSOCIATION - GULF COOPERATION COUNCIL CHAPTER

A REVIEW OF THE 9TH TECHNICAL CONFERENCE

Over 130 delegates representing the major oil and gas companies in the Gulf region attended the 9th Technical Conference which was held in Abu Dhabi on May 23, 2001.

In his opening address, the Chapter's Chairman, Dr. Shaikh Mohammed Bin Khalifa Al-Khalifa, welcomed delegates to the Conference, which was held for the first time outside Bahrain, and extended his thanks to ADNOC for their assistance in supporting the Conference.

Dr. Shaikh Mohammed presented a brief overview of developments in the gas industry and the increasingly important role that natural gas continues to have in the region's industrial development.

While praising new and emerging technology, he warned that industry should not lose sight of the need to develop its human resources in today's highly competitive markets.

Dr. Shaikh Mohammed called on all members of the Chapter to promote interaction and the exchange of knowledge and experience for the well being of the gas industry.

He also thanked the members of the technical and organizing committees for their hard work and the key note speakers for sparing their valuable time to attend.

In his closing remarks Dr. Shaikh Mohammed emphasized the objectives and role of the Chapter and wished all the delegates a very successful and enjoyable conference.



AN INTEGRATED APPROACH TO A DE-REGULATING MARKET

STEVE ROBINSON

The keynote paper was presented by Steve Robinson who spoke on the integrated approach to a deregulating market and focused on how technology is being applied in the gas pipeline industry to effectively manage the changes brought about by deregulation.



As pipelines move from being pure merchants to transporter merchants and eventually to pure transporters, the need becomes stronger for better, faster information facilitating improved decision-making. The deregulation of the global gas markets has led to improved methods of turning data into real-time business decision support information. As the protection of monopoly status gives way to demands of open access and free enterprise, pipeline companies are turning to the world of high technology to find ways of solving complex operations/business decision support problems. Even though true open access has not penetrated every part of the world, it is arriving swiftly.

Deregulation of the gas Industry has encroached on the global market in stages. The US had initiated the process way back in 1978 but are still a long way from achieving optimum operations. The UK market has

(Continued on page 2)

(From page 1)

phased in de-regulation over a period of five years, slowly removing price controls on the incumbent monopoly supplier' BGT. The European Gas Market is deregulating, however it is still based on long term supply contracts, which are linked to the price of oil. For a deregulated gas industry to achieve its potential of providing truly competitive prices and adequate choice of supply to customers, this is just one of the many issues that needs to be addressed in the Far East countries that have recently committed to deregulating their gas industry while the likelihood of cross border gas pipelines is moving swiftly towards the Middle East.

VAPORIZED OIL AS A FEED GAS IN AN INTEGRATED PROCESS

FROM RESERVOIR TO LPG PLANT

FAISAL M. AL-MAHROOS AND K. KUMAR, BANOCO

Faisal M. Al-Mahroos and K. Kumar, presented a paper discussing the process of vaporization of residual oil recovery and the construction of a gas reservoir model that can be used for gas quality forecasting. It highlights the process of enrichment of lean khuff gas by intermediate components that have been vaporized from residu after gas flooding. The gas, which thus has been enriched, is sent to a LPG plant to knock down C3, C4 and C5+ components as LPG Naphtha products.

The process started early in 1938 by a simple gas injection to maintain the reservoir pressure of the recently discovered oilfield at that time, the Mauddud zone. Associated gas production until 1964 was the only gas solution. However from 1965, the free gas from the secondary gas cap was developed with continued gas injection which is

enriched with lighter hydrocarbons stripped form the oil contacted by the gas as compared to the injection gas. That is, in the early sixties, the gas started to breakthrough.

The Management of the Bahrain National Oil Company



evaluated the economic opportunity of these rich gases for LPG production in the early seventies. Accordingly, Banagas was established to process these gases by constructiong a LPG plant that went into operation in 1979.

Most of the LPG plants are built to process rich gases that are in solution in oil which eventually get separated from the oil during the production process that starts from the oil reservoir and finishes at the separation facilities. However, the Banagas LPG plant processes a gas initially produced from a non-associated lean gas reservoir, then injected in the oil reservoir to be enriched through a process known as oil vaporization and finally produced along with oil. That is, the injected gas is being produced along with the oil as associated gas that is transmitted to the Banagas LPG plant for recovering the Propane, Butane and Naphtha contents of the gas.

The paper estimates that re-characterization of the reservoir oil was necessary to realistically estimate the products from the injection process, that the lean injection gas evaporates significant volumes of the reservoir oil and also that the oil recovery estimated from cased hole logs is very close to the sum of recoveries from volumetric balance and evaporation. Furthermore, it also shows that a scheme using EOS simulation has been devised to calculate the evaporated oil in an immiscible gas project.

WHICH TECHNOLOGY FOR RECOVERING NGL VALUE?

YUV R. MEHRA, SAUDI ARABIAN OIL COMPANY

Yuv R. Mehra from Saudi Arabian Oil Company presented a paper summarizing and comparing the technical and sizing features for a natural gas stream having a middle-of-the-road composition wherein two major technologies, cryogenic turbo-expander and non-cryogenic enhanced absorption were compared in considerable depth.

Many processes have successfully evolved over the years to recover the value contained in ethane, propane and heavier natural gas liquids (NGL). Saudi Aramco recognized that its natural gases are significantly richer in their NGL content than those common to North America and the North Sea, where the NGL recovery technologies were primarily developed. The NGL components present in natural gas stream, whether it is associated with the production oil or produced separately from a gas well comprise ethane,

(From page 2)



propane, butane and natural gasoline. The incremental margin between the price received as a petrochemical feedstock over its Equivalent Price as a part of the natural gas fuel drives their recovery.

While propane, butanes and natural gasoline components are fractionated liquid products with many uses as feed stocks for the petrochemicals industry, including ethylene production and their products are shippable over land thereby providing flexibility in modes of shipment to various markets, the market for ethane is primarily limited to ethylene production and its feedstock product requires pipelines for transportation to ethylene crackers. Hence, the term 'free ethane' relates to the portion of ethane that may be recovered at no incremental capital and operating costs from a propane-plus recovery plant. It is also important that on-line switching of operating modes between C3+ and C2+ recovery be achievable.

Most natural gases contain higher value components that can be cost effectively recovered to maximize recovery of value as opposed to using them as fuel. Two major commercial technologies - the "cryogenic turbo-expander" process and non-cryogenic "enhanced absorption" process - allow high recoveries of NGL components. C2+ richness of natural gases can vary significantly, and is important in determining which process is used as richer gases, common in the Arabian Gulf region, tend to favour the use of the enhanced absorption process.

HIGH SOUR GAS PROCESSING IN AN EVER-GREENER WORLD

FRANCOIS LALLEMAND, TOTAL FINA ELF, IFP

This paper presented by Francois Lallemand deals with the Total Fina Elf experience in producing gas from slightly sour to very sour gas reserves and presents state-of-the-art acid gas removal technologies developed and commercialized by ELF.

It is a general assumption that for decades to come, gas will primarily be the energy source of choice to meet environmental standards worldwide.

Fortunately enough, the gas reserves have been growing though quite often new gas is found to be of

substandard quality in remote and stranded areas of the world. When natural wellhead or oil filed associated gases are highly loaded with acid gases, the dilemma facing most operators is what to do, how and when to best exploit these poor quality resources. Total Fina Elf too is increasingly faced with these choices together with its operating partners around the world; more particularly in areas known to have highly sour oil and gas reserves such as the Caspian Sea region and the Middle East.

Acid gas cycling and/or disposal by reinjection offers a promising alternative to avoid sulfur production and reduce CO₂ emissions to the atmosphere simultaneously. To this end, technologies of choice are those which offer maximum simplicity and require least downstream processing intensity for reinjection. Today the advanced activated MDEA process offers economy and versatility in handling both selective and complete acid gas removal services and the process has a good synergy with modern Claus sulfur recovery processes and remains among the best alternatives even when no sulfur recovery is foreseen.

Nevertheless, these are limitations of even the most advanced amines only based gas treatment technologies in handling very highly acid gas loaded natural or associated oil field gases; especially for bulk acid gas removal when the acid gases are destined for cycling and/or disposal by reinjection. The paper further discussed the limitations of present competing gas technologies in handling the very highly sour gas reserves some of which today are bottled up waiting for better and more cost effective solution.



(From page 3)

PROCESS SAFETY MANAGEMENT (CASE STUDY)

HASSAN ALI AL-ARADI & AHMED KHALIL



Hassan Ali Al-Aradi, and Ahmed Khalil from the Bahrain Refinery presented a paper describing the Company's experience in implementing a Process Safety Management (PSM) system. This included the initial evaluation of the existing management

systems required by the PSM as since the introduction of the Occupational Safety and Health Administration's Legislation OSHA 1910.119 the Company had launched a programme to implement a Process Safety Management (PSM) system consisting of 12 elements with a PSM awareness campaign launched as part of the implementation plan. The campaign included development of educational materials, training presentations as well as posters illustrating the various elements. During the implementation phase, the company appointed leaders for specific PSM elements and each leader had a team of experts in the element being addressed.

The Company developed and implemented all PSM elements. This paper thus presented by both Hassan Ali Al-Aradi and Ahmed Khalil included lessons learned during its development and implementation stages.

how the use of new valve technology and downcomer design can combine to provide up to 60% more capacity over conventional valve tray designs.



While conventional valve trays have traditionally reigned

in gas plant towers, operators are revamping their gas plants with advanced technology trays to meet the ever-increasing demands placed upon these units. These devices provide significant capacity gains while maintaining or improving efficiency - two aspects previously attainable only through the use of packings. The unique features of these trays enable them to handle the high liquid rates characteristic of gas plant towers thereby making possible a combination of high capacity and efficiency. The ability to install these devices using existing tray supports without additional welding further ensures an economical revamp.

That is to say, high capacity trays that utilize a truncated downcomer are well suited for Gas Plant column revamps since they allow increased liquid headling capacity without sacrificing vapor capacity or tray efficiency. Equally, they allow greater downcomer areas without sacrificing bubbling area or flow path length. Other devices that use multiple downcomers can suffer from sort flow path lengths and poor - efficiency. Also, if the area under the multiple downcomer boxes is not an active bubbling area, the increased liquid capacity cuts into the vapor handling capacity of the tray.

SOLVING HIGH LIQUID RATE PROBLEMS IN GAS PLANT COLUMNS

TONY HOOD, SAINT GOBAIN NORPRO

Another paper was presented by Tony Hood, Regional Manager, Saint Gobain Norpro, which outlined the design features of advanced technology in gas plant towers and showed how these features help solve the problems experienced when trying to design trays in higher liquid rate applications, such as those typically found in Gas Plant columns. It further threw light on

NEW BOIL OFF GAS RECOVERY UNIT FOR PROPANE AND BUTANE STORAGE TANKS AT GASCO RUWAIS

SALEM AL-SAYEGH, GASCO

Salem Al-Sayegh, Lead Process Technologist, GASCO focused his paper on the new boil off gas recovery unit for propane and butane storage tanks at Abu-Dhabi Gas Industries Ltd.

(From page 4)



The feed to Gascois Ruwais fractionation plant increased as a result of upstream developments. Consequently, two new storage tanks for propane and butane were constructed in addition to a new boil-off recovery unit which was designed with the

constraints of non-availability of cooling water, auxiliary refrigerant from outside the unit and that the electric power was the only available utility.

The main process equipment and the design features of the new unit include a three stage centrifugal compressor and an air cooled condenser. Three coolers in series chill the propane, a slipstream of the liquid propane from each cooler is recycled to the shell side of the cooler and used as a refrigerant to chill the propane and the butane boil off is condensed in a butane condenser by a slipstream of propane.

Such design is not common. The system has been in operation for nearly three years and is generally achieving the design throughputs.

SOLVING AROMATIC AND CO₂ EMISSIONS WITH DRIZO GAS/GLYCOL DEHYDRATION PROCESS

THIERRY FONTAIN, PROSERNAT/OPC DRIZO

Thierry Fontain of PROSERNAT/OPC DRIZO spoke on solving aromatic and carbon dioxide emissions with the DRIZO Gas/Glycol Dehydration Process.

The paper presented compared vent emissions of both DRIZO regeneration units unit versus stripping gas for different operating conditions as well as summarized the operational performance of DRIZO units.

It is generally known that producing natural gas, dehydration is almost always required as water in gas creates significant problems such as hydrate formation and corrosion. For decades, the natural gas industry's standard practice has been to employ tri-ethylene glycol as gas desiccant. This

process has been successfully adapted to cope with the development of adjacent processes and market requirements for lower water dew points. While the traditional stripping gas process can attain dew water point near -60°C .



This loads gas plants vents and flares with both carbon dioxide and aromatics.

As environmental emissions have become a concern to the entire natural gas industry, it is always balanced with the imperatives of reasonable investment levels and production costs. By maintaining the advantages of a well proven and economical process - the glycol dehydration unit - the DRIZO gas/glycol process uses a recoverable liquid solvent to strip lean glycol while approaching the zero emission target and water dew points to below -80°C . Thus, the application of a modification to the proven gas/glycol dehydration process - the DRIZO solvent stripping process - make low emissions and low water dew point compatible requirements. Additionally, what was previously an environmental concern - BTEX - becomes an extra saleable liquid stream.

When treating gases with significant CO₂ content, CO₂ emissions can also be significantly reduced so that only release is the small amount of CO₂ dissolved from the gas in glycol at contactor. Burning stripping gas which first appears an easy solution to the BTEX emissions on a stripping gas process converts BTEX emissions into CO₂ emissions rather than resolving the emissions problem. Emissions from the stripping gas process increase significantly when low temperature processing requires increased lean glycol concentration (limited at 99.97%) with the additional opex expense of large stripping gas flow.

The DRIZO process has demonstrated that it can readily produce 99.95% up to 99.99+% in industrial service and so offers a wide range of applications in terms of water dew point without an emissions penalty.

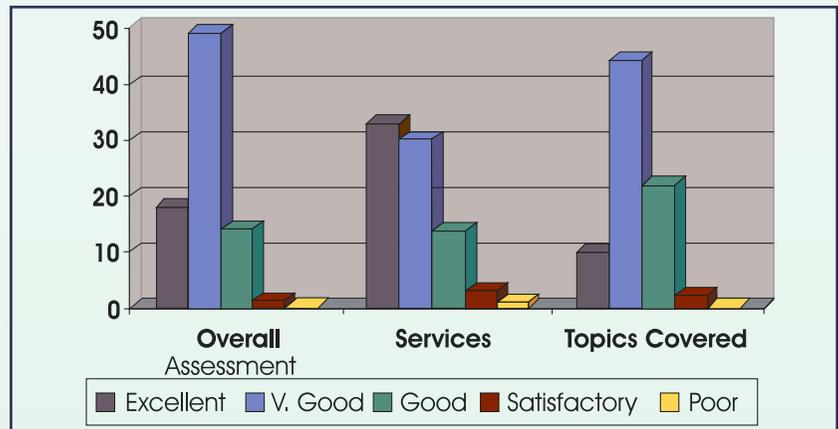
Scenes of the 9th Technical Conference



A Brief Assessment of the 9th Technical Conference

The 9th Technical Conference held on May 23, 2001 at the Abu Dhabi Hilton in UAE was attended by over 130 people.

The general feedback from the delegates was very good (see graph) and most of the papers were well received. Saudi Aramco's paper presented by Yuv R. Mehra was voted as the best paper at the Conference. The author will receive his award in the forthcoming 10th Technical Conference.



PREPARATION UNDERWAY FOR 10TH TECHNICAL CONFERENCE

The preparations for the 10th Technical Conference to be held in Doha - Qatar on 22nd May 2002 was the main point of discussion for the Technical Committee meeting held in Bahrain in November 2001. The technical papers status and the conference arrangements were discussed in details. It was agreed to finalize the paper selection in the first half of January 2002 while the arrangements will be reviewed again in another meeting in February 2002. The meeting also agreed to arrange for a site visit in Qatar on Thursday 23rd May 2002 and to coordinate with John Campbell to run a gas processing course in the same week.

80 TH GPA ANNUAL CONVENTION



Mr. Mohammed BuRashid (Banagas) and Mr. Kefah Al-Faddagh (Saudi Aramco) attended the 80th GPA Convention in San Antonio, Texas, United States. This Convention was held under the theme "Creating value worldwide from wellhead to market". Mr. BuRashid and Mr. Al-Faddagh also attended the GPA international exchange breakfast meeting. During the meeting, Mr. BuRashid made a brief presentation on the Chapter's activities and plans. He also attended a



special meeting on the international gas processing industry. The purpose of the meeting was to explore the possibilities for cooperation between GPA organizations on a global scale in an effort to better serve the worldwide gas processing industry.



10th TECHNICAL CONFERENCE

DOHA - QATAR
(22nd May, 2002)

ABOUT THE GPA - GCC CHAPTER

PURPOSE

The purpose of the GPA - GCC Chapter, formed in April 1993, is to serve as a forum for the exchange of ideas and information concerned with the gas-processing industry with a view to improving plant operations and related activities.

MEMBERSHIP

Membership in this organization is open to GCC REPRESENTATIVES OF:

- (a) Companies owning and/or processing gas. These are classified as "members".
- (b) GCC-based organizations involved in the supply and/or services to the gas industry. These are classified as "Associate members" and are entitled to vote on all matters in the Organization's Annual meeting except for the Executive Committee elections.

All membership applications are considered and approved by the Executive Committee.

DUES

The annual dues for Chapter membership is US\$1,325, payable in advance on or before the first day of March of each year.

EXECUTIVE COMMITTEE 2000/2001

Chairman

Mohamed Bin Khalifa Al-Khalifa
The Bahrain Petroleum Company

Vice-Chairman

Mohammed A. Al-Abdulmoghni
Saudi Aramco
Secretary - Treasurer
Ahmed Majid
Bahrain National Gas Company

Members

Abdulrahman Al-Suwaidi
Qatar General Petroleum Corporation

Salem Saeed Al-Muhairi
Abu Dhabi National Oil Company

Yousif Abdulla Yousif
Gulf Petrochemicals Industries (Bahrain)

Ali Ahmed Abdulla
BP-AMOCO Sharjah

Samir Khoury
C.C.C. (Suppliers Representative)



TECHNICAL COMMITTEE 2000/2001

Company	Representative
SAUDI ARAMCO	Mohammed Al-Abdulmoghni
	Kefah Al-Faddagh
ADNOC	Salem Saeed Al-Muhairi
BP-AMOCO SHARJAH	Ali Ahmed Abdulla
ADCO	Adel Wasfi
GPIC	Yousif Abdulla Yousif
BAPCO	Ahmed Al-Khan
BANAGAS	Mohammed Bu-Rashid

For more information please contact:

Ahmed Majid, Secretary - Treasurer
P.O. Box 25094, Awali, Bahrain
Tel. +973-752402
Fax: +973-756991
e-mail: majid@banagas.com.bh
Web site: www.banagas.com.bh/gpa