A SUCCESSFUL CONFERENCE IN KUWAIT

The Chapter 12th Technical Conference was held on May 5th 2004 in the State of Kuwait. The Chapter’s Chairman Dr. Shaikh Mohammed Al-Khalifa in his opening remarks touched on the latest developments and investment in the gas industry in the Gulf cooperation council region and showed that the Chapter continued to grow in terms of the numbers participating in the conferences organised by the Chapter and also in the services provided.

Dr. Mohammed also noted the continued coordination and cooperation with mother Gas Processors Association of the USA and other international chapters.

In concluding remarks he said we should have to benefit from the latest technology available and pay increased attention to the development of our human resources and the safety of our gas operations.

Dr. Mohammed expressed his thanks and appreciation to the Kuwait Petroleum Company (KPC) and to Kuwait National Petroleum Company (KNPC) for hosting and sponsoring the conference, which this year attracted over 130 participants.

NADER SULTAN: KUWAIT IS CURRENTLY CONSIDERING THE POSSIBILITY OF INCREASING GAS PRODUCTION

The Deputy Chairman & Chief Executive Officer of Kuwait Petroleum Corporation (KPC) has revealed that Kuwait is considering the possibility of increasing gas production.

Addressing the Conference in Kuwait, Mr. Nader Sultan said that Kuwait was looking into various options to increase local production of gas. He pointed out that Kuwait Oil Company (KOC) and Kuwait National Petroleum Company (KNPC) would minimize the disposal of surplus gas from the oil fields. One of the options will be to finalize the reconstruction of the gas collection centers, which were destroyed during the Iraqi invasion of Kuwait, he said.

He explained that the exploratory operations were focused on locations with potential gas reservoirs. He pointed out that arrangements had been made to recover the ethylene gas, and said that such steps, upon evaluation, were found insufficient to cover Kuwait’s gas requirements and to meet the deficiency in power generation.

Mr. Sultan disclosed that Kuwait had already commenced negotiations with gas-rich neighbouring countries such as Qatar, Iran and Iraq. He reiterated at the Conference a previous suggestion that many gas industrialists felt that a gas network within the Gulf countries, including Iran, should be considered.

"The key message which I have today is about the need for further regional cooperation in the utilization of gas", Mr. Sultan told the Conference.

Mr. Sultan briefed the audience about the mechanism of the utilization of gas by the petroleum companies in Kuwait. He pointed out that a new group would be established to manage all the gas lines with the aim of creating a central interconnected system. He confirmed that a plan was in hand to found a new entity to oversee all gas activities.

In conclusion Mr. Nader Sultan said the project’s overall goals were to achieve system integrity and operational control.
Seven separate organizations currently own and operate Kuwait’s gas and condensate pipeline infrastructure, resulting in a multitude of separately managed pipeline systems and related facilities. When viewed as an interconnected whole, the relatively simple individual systems form an operationally complex network that spans the entire country. This system had recently experienced two gas pipeline failures that resulted in personnel injuries and a loss of oil production. In an effort to develop a clear system to accommodate health, safety and environmental (HSE) concerns and to maximize operational efficiency throughout the system, KNPC hired Houston-based Paragon Engineering Services, Inc. to gather pipeline integrity information, provide mapping services, review and develop inspection and maintenance schedules, generate as-built documentation, and formulate an integrated centralized management system for the entire gas and condensate infrastructure. This work has laid the foundation for development of a systematic, long-term plan for managing the operation of Kuwait’s gas and condensate resources.
NEW TECHNOLOGY AIDS IN EFFICIENT, HIGH RECOVERY OF LIQUIDS FROM RICH NATURAL GAS STREAMS

Turbo expander technology is the option of choice for the recovery of liquids of natural gas specially ethane and heavier. After more than thirty years, this technology has achieved certain maturity. However, while solutions are available through mature technology, technologists continue to innovate and develop new and more efficient solutions. The investment in units utilizing proprietary/licensed "state of the art" technology pays off in a very short time resulting in a cost effective and efficient unit.

In the Arabian Gulf area, there are significant quantities of natural gas associated with oil resources. This gas is very rich in heavy components, which most often requires the use of additional external refrigeration to aid in the recovery of liquids. There are many cryogenic turbo expander schemes that use refrigeration, but the unique characteristics of the Arabian Gulf gas require an approach where the right combination of refrigeration and turbo expander cryogenic technologies yields the best results. This paper describes a series of innovative process schemes to efficiently recover liquids from rich or associated natural gas.

Using a mature technology as a base case process, the paper discusses a number of different novel designs showing savings in capital expenses (CAPEX) and operational expenses (OPEX) up to 30% reduction in energy consumption without sacrificing the level of recovery of liquids, optimizing equipment count and layout requirements. A key element of these efficient technologies is its use of true refluxed demethanizers to recover ethane and heavier components. An economic basis is also presented to compare the different cases. Additionally, a simple scheme applicable to revamps is shown as a candidate to upgrade existing plants.
CAUSES OF AMINE REGENERATOR TRAY DAMAGE

Rich amine regenerator’s trays in amine sweetening units are vulnerable to damage due to mechanical design deficiencies and/or process upsets. Therefore, it is important in the design and operation of amine sweetening units, to recognize the conditions that lead to this damage. This paper discusses these conditions and highlights some design considerations to avoid tray damages in amine regenerators. Case studies demonstrating regenerator tray damages during normal operations and start-ups of gas sweetening units at Saudi Aramco’s Shedgum and Uthmaniyah Gas Plants are presented.

HHH AND ETHANE PLUS PROCESSES (PATENT PENDING)
INNOVATIVE PROCESS INTEGRATION IPI APPLICATION FOR NEW NGL RECOVERY PROCESSES

NGL is recovered from natural & associated gases and mainly contains ethane, propane and butane plus. Typical ethane recovery is 80 % and above and typical Propane plus recovery is almost 99 %.

Ethane is used as a petrochemical feedstock to produce ethylene and propane while can be used also a petrochemical feedstock to produce propylene, is also used, when mixed with butanes, as fuel.

Different technologies exist for NGL production which aim to:
- Deep NGL recovery
- Low CAPEX & OPEX

Process challenges for NGL recovery Processes are:
- High ethane (above 95%) for ethane recovery
- 99+% propane recovery during ethane recovery
- Presence of CO2 and how to avoid solid formation
- Flexibility of operation
- Reduction of capital cost
- Reduction of energy consumption
- Others

The “HHH” and “Ethane Plus” processes are mainly applied for 99+% recovery of NGL with high CAPEX and OPEX reduction in comparison with almost all available state of the art licensed technologies.

The process is designed for deep recovery of NGL from natural and associated gases (lean and rich composition) at pressure and temperature levels, which are practically in the operating envelope of almost all gas processing facilities around the glob.

A major advantage of the new process application is the reduction of the processing equipment size especially the export compression package with a clear reduction of energy consumption.

This new technology, which is cryogenic in nature, applies the IPI concepts, invented and applied by the Author. These concepts are based on the following:
- Process Integration of process equipment
- Innovative operation of a key process equipment in a new process location whereby major CAPEX and OPEX are easily realized.
- Use of all well proven gas process equipment
Based on a proposed process for conversion of natural gas to Natural Gas Hydrate, NGH, the amortized total capital investment, operation and maintenance costs and total cost for production of NGH have been obtained. The effects of different operational conditions such as seawater temperature as a cooling media and the hydrate-stored temperature have been investigated. The economic parameters for marine transportation of NGH from Asaluyeh port in the south of Iran to the different gas markets, as a case study, have been obtained. Also, the required NGH ships and their operation costs for different gas markets have been obtained.

Natural gas undergoes several treatment steps on its way to a liquefaction unit. The first steps remove most of the CO2 and H2S in an amine unit followed by others that remove mercury, water and remaining sulfur species using solid adsorbents. Mercury and water must be reduced to very low levels, typically <0.01 µg/Nm3 and < 0.1 ppm vol respectively, in order to avoid corrosion and stress cracking in the LNG plant’s aluminum heat exchangers and to prevent hydrate formation in the cold section of the plant. Also note that LPG is often separated from the natural gas feed and, to meet sales specifications, mercaptans must be removed.

The objective of this paper is to present the synergy between classical processes for natural gas treating (water and sulfur removal) and processes using molecular sieves. In the field of natural gas purification by adsorption, the Multibed process can be used either as a finishing step for one of the major treating processes or, in some cases, as a replacement for the entire treating system.
A NEW LOOK AT AMINES: EXTENDING THE GAS INDUSTRY WORKHORSE TO NEW LIMITS

When it comes to processing sour gas most operators would agree that the amines process is the "workhorse" of the gas processing industry. Today the experience, reliability and ready availability of low cost amines is the key to implementing sour gas treatment projects that will be cost effective to make on specification sales gas for many traditional sour gas treatment applications:

- Purifying natural gas for LNG feed
- Selective removal of H2S with a maximum slippage of CO2
- Bulk removal of acid gas for re-injection

This paper presents a review of the secondary DEA and tertiary MDEA amines process technologies with a renewed look to acid gas removal performance and energy efficiency. The impressive "know-how" wealth accumulated by Total (formerly TotalFinaElf) via past achievements of Elf (formerly SNPA) has established a benchmark for the amines technology. Higher amine concentrations with proven corrosion free applications based on good engineering design lead to lower solvent circulation rate and costs. Use of additives called "energizers" with MDEA allows bulk CO2 removal with all the added benefits of using MDEA. On the other-hand use of proprietary contacting devices and other design features allow MDEA to offer maximum slippage of CO2.

Finally to culminate the new look, a novel MDEA process is presented which is shown to achieve simultaneous selective complete H2S removal and dehydration eliminating the traditional glycol dehydration process usually following the amine unit and thus extending the industry "workhorse" to new product quality specification limits.

RETROFITTING THE EXISTING FLARE / BURNERY FOR SMOKELESS OPERATIONS

Plants designed before eighties are equipped with non-smokeless (smoky) flares and burn pit. Flares can be converted to smoke less operation by atomizing steam and changing the flare tip. Considering the environmental awareness, most of these old flares were converted to smoke less flare. Unlike the refineries, off spec products during startup / maintenance from gas plants cannot be stored due to high RVP and same has to be disposed off by burning. Considering the energy prices on those days, burning was unavoidable evil.

Liquid are routed to burn pit due to the low system pressure. These are large pits, which can hold the hydrocarbons. Drained hydrocarbons are being burnt at the surface of the pool. Air diffusion to the top of the pool is limited by natural convection. This often leads to plume of smoke and considerable pollution. This is inherent limitation of the burn pit.

System has to be changed completely if the smoke is to be avoided. The following approach is considered. Preventing generation of off spec product during normal operation by developing operating procedure with or with out minor modifications.

Recovering the drained products by installing a recovery system to produce then valuable products. Burn the excess hydrocarbon more efficiently, which will effectively avoid smoke. This system is mainly based on pumping the drained fluid to high pressure and the high pressure is used to atomize the hydrocarbon, which leads to smoke less operation. Implementation of the above schemes will completely avoid smoke from Gas plant and refinery.
Dr. Shaikh Mohammed Al-Khalifa – Chairman of the Chapter and Mr. Mohammed Burashid, member of the technical and Executive Committee, participated in the 83rd GPA Annual Convention which was held in New Orleans, Louisiana, USA in March 2004. Dr. Al-Khalifa made a brief presentation on issues related to the Chapters activities and information on Current major projects which are being implemented by member companies.

Dr. Al-Khalifa and Mr. Burashid also represented the GCC chapter at the Global Meeting at GPA Convention. The meeting was attended by representatives from all GPA international organizations: AVGP (Association of Venezuela Gas Processors), CGPA (Canadian Gas Processors Association), GPA (USA – Gas Process Association), GCC (Gulf Corporation Council). The meeting was held to discuss the proposal of sharing valuable technical information of each organization via a website to provide a better means of serving operating companies worldwide.
Thank you for supporting

Dr. Shaikh Mohammed Al-Khalifa Chapter’s Chairman Presented Chapter Trophy to Mr. Nader Sultan Deputy Chairman & CEO Kuwait Petroleum Corporation-KPC, Mr. Ahmed Al-Arbied Chairman & Managing Director Kuwait Oil Company-KOC And Mr. Hani A. Aziz Hussain Chairman & Managing Director Kuwait National Petroleum Company - KNPC.
The Board Members of the GPA GCC Chapter wish to extend their thanks and appreciation to Kuwait National Petroleum Company (KNPC) for sponsoring the 12th Technical Conference.

BEST PAPER AWARD


SEE YOU IN 13th Technical Conference
J.W. Marriott Dubai, May 11, 2005
Over 130 delegates attended the 12th Technical Conference, held on May 5, 2004 at the J.W. Marriott in Kuwait.

The general feedback from the delegates was excellent with most papers well received. The KNPC paper "Kuwait Gas Management System (KGMS) - Case Study" presented by Hamza Bakhash, was voted the best paper at the conference. The author will receive his award at the forthcoming 13th Technical Conference.
SCENES FROM THE 12th TECHNICAL CONFERENCE
ABOUT THE GPA - GCC CHAPTER

OUR MISSION
To serve as a Forum for the exchange of ideas, technology and information that will benefit both the upstream and downstream Gas Processing industries, and their Suppliers, with a view toward improving Plant Operations, Health, Safety and Environmental performance in the GCC countries.

OUR VISION
To be the focal point and the main source of information on the Gas Processing industry in the Gulf Cooperation Council countries.

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 service 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.

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