Representative name: Bulent Turan, Global Vice President

PECOFacet is a proud sponsor of the GPA globally with representation in most GPA operating regions. PECOFacet as a global leader in filtration and separation supports the GPA and the affiliated GPSA (Gas Processor Supplier Association) by being a participating team member in the development of the filtration and separation section of the GPSA Engineering Handbook to assist producers, processors and suppliers in evaluating, designing and implementation of sound technologies in the natural gas industry.

As a company, PECOFacet is known for providing filtration solutions using innovative product designs that are process proven for over 75 years in natural gas applications. This includes black powder management, amine & glycol contaminant control optimization, plant inlet separation and downstream coalescing management. These core competencies help PECOFacet’s valued customers maintain a more sustainable and environmentally secure industry.

For the first time in the GPA-GCC Chapter event history, an exhibition was organized which brought together various vendors from the Oil & Gas Industry to exhibit and demonstrate their products. This conference brings together more than 180 companies and technical people from all fields of the oil & gas sector to interact and exchange ideas and provides a platform for them to discuss the various challenges faced by them.

Company Name: PECOFacet (a Clarcor Company)

EXHIBITION

For the first time in the GPA-GCC Chapter event history, an exhibition was organized which brought together various vendors from the Oil & Gas Industry to exhibit and demonstrate their products.
Caltec is the world leader in production boosting and compact separation, enhancing production processes for over 100 oil and gas fields around the world. Caltec’s Wellcom Boost™ system increases producing LP wells or can revive ‘dead’ wells by utilizing energy from HP wells otherwise wasted by choking. Caltec’s technology de-bottlenecking compressor stages and recovers flare gas, using no moving parts, consuming no power/fuel gas and virtually maintenance free. Caltec has recently supplied multiple solutions to Saudi Aramco to increase production from Saudi Aramco’s oil & gas wells as well as reduce emissions. Caltec is part of the Petrofac group and is pleased to be presenting and exhibiting at the GPA-GCC Technical conference in Bahrain.

Company Name: Caltec Ltd, UK
Representative: Syed M Peeran, Process Manager

Evonik is one of the world’s leading specialty chemicals companies. With around 33,000 employees, it generates sales of roughly €13 billion.

Company Name: Evonik Industries AG
Representative: Alaa Shanableh – Regional Manager – MEAF & Caspian

Johnson Matthey is very active in other areas such as refining, purification, technology and are the market leader when it comes to purification of hydrocarbon streams. Johnson Matthey is a UK based company and will be celebrating its 200th anniversary in 2017. The company is a major player in catalyst business, rooted in science and technology and are the market leader when it comes to purification of hydrocarbon streams. Johnson Matthey is very active in other areas such as refining, purification, Ammonia and Methanol industries, precious metal catalyst and other sectors. Johnson Matthey has been a very active member of the GBA in all parts of the world and supports the agenda of GPA Middle East.

Company Name: Johnson Matthey
Representative: Adnan Ghani, Technical Sales Manager-MEA Region, Tore Larsen, Product Specialist, Halvor Thune, Director Apt. Applications

SUCCESSFUL PILOTING OF ABOVE GROUND SULFUR SEAL TECHNOLOGY
Maher H. Al-Abdullatif (Author)- Saudi Aramco

As part of the ongoing initiatives to meet the Kingdom’s growing demand for cost effective and clean energy sources, Saudi Aramco successfully boosted the gas processing capacity of a major gas plant by about 7% by adopting an innovative above ground sulfur seal technology. The realized gas processing capacity will await additional sales gas to the Master Gas System (MGS), and avoid consuming 17,000 barrels of oil equivalent (BOE) per day during peak summer demand. This was achieved by implementing modifications that allowed for de-bottlenecking the sulfur recovery units (SRUs) by replacing the existing conventional underground sulfur seal with an above ground seal technology. This paper includes background information about the encountered gas processing limitation and a description of the implemented modifications, and highlight results achieved after successfully piloting the new sulfur seal technology.

PLANT INTEGRITY WINDOWS IMPLEMENTATION IN GAS PLANTS
Rayed A. Al-Bassam - Saudi Aramco

Plant Integrity Windows (PIW) is an advisory system, which was developed in collaboration with the Process and Control Systems Department for monitoring the plant performance, integrity and safety in a focused and user friendly manner. In corrective actions required. The PIW system and the Laboratory Information Management System (LIMS) to retrieve process parameters on a real-time basis and compare those readings against a set of predefined limits that are categorized into three categories: performance limits (PL), integrity limits (IL) and safety limits (SL). The application then flags the excess, and users can scroll for the possible root causes, consequences and required corrective actions. The objective of this paper is to demonstrate the process and functionality of the PIW application that is implemented across gas plants and other operating facilities within Saudi Aramco.

OPERATION FLEXIBILITY AND LOAD SHARING CONTROL SYSTEM
FOR KOC GAS BOOSTER STATIONS
Hamad R. Al-Zuwayer & Abd El-Rahman Hassan-Kuwait Oil Company

Boosting stations on gas pipelines typically consist of several compressor trains in parallel where each train is composed of a compressor unit, control valves, scrubbers, and coolers as shown in Fig.1. Therefore, the decision variables in such systems are the set point limits (SL). The application then flags the excess, and users can scroll for the possible root causes, consequences and required corrective actions. The objective of this paper is to demonstrate the process and functionality of the PIW application that is implemented across gas plants and other operating facilities within Saudi Aramco.

In addition to that, the LP compressors are designed to feed HP gas compressors trains assigned for that particular gas booster station and/or to discharge its flow to HP gas network to feed other gas boosting stations connected to the same pipeline networks as needed. By this configuration and control setup, operation flexibility of BS-160 is dramatically increased compared to other existing gas booster station facilities such as BS-140, BS-150; to meet all expected operating scenarios. Consequently,
WASTE MANAGEMENT CHALLENGES & ACHIEVEMENTS
Isamal Salih Al-Khabani & Poni Saravanan-ORYX GTL
In recent years there is a continuous increase in energy demand and the need for eco-friendly fuels in the global markets. Gas to Liquids, or GTL, is a technology breakthrough for converting natural gas into high-performing, ultra-clean liquid fuels by means of Fischer-Tropsch (FT) process. The case study described in this paper is based on the ORYX GTL plant which produces nominally 34,000 barrels of liquid fuels per day. The objective of this paper is to describe the challenges in management options to deal with various wastes c) To implement the 4Rs (Reduce, Recover, Reuse, Recycle) approach to waste management d) To recommend to improve the waste management through integrated waste management strategy.

The approach to solid waste management in GTL industries includes waste source reduction, optimal waste minimization in general, by recycling, reusing, composting, incineration with or without energy recovery, fuel production via pyrolysis and finally land filling disposal. This paper describes details of ORYX GTL challenges faced to manage our wastes and investigation of various technologies which could fulfill precise criteria - providing a one-stop disposal solution for all process wastes, minimizing landfill space required for disposal, and reducing greenhouse gas emissions resulting in a cleaner, safer environment. In addition this paper also describe our achievements in identifying advanced and emerging technological solutions to reuse,

GEPIC EXPERIENCES IN FAILURES OF VERTICAL TYPE WASTE HEAT BOILERS
Eyad Rafei-Sitra, GPIC Bahrain
GPIC has a single vertical type waste heat boiler embedded with pre-heater in ammonia plant synthesis loop. Tubes of this WHB had failed several times due to under-deposit corrosion mechanism. In all failed cases, Similar failure patterns were noted invariably. bottom part of tubes at central part of tube-sheet are mostly thinning of walls. This paper will outline the details of WHB, details of its failures with inspection findings and remedial actions implemented. This paper also touches upon how PWHT procedure of welding joints of tube bundle can cause the failure of tubes due to thinning of its walls.

MODULAR PACKAGED PLANTS FOR FAST-TRACK GAS PROJECTS
Naji Alwahed - Dubai, UNITED ARAB EMIRATES
Every year, the world uses nearly 100 trillion standard cubic feet of natural gas and that number is likely to increase. With growing demand and tightening supply of easily accessi Modularized packaged plant solutions can deliver faster on-stream time, lower takes place inside the controlled environment of a custom-built workshop in an area with excellent supply chain and logistics. Coupled with sophisticated engineering and modularization techniques, a modularized project strategy can present several advantages including reduced construction rework, higher safety assurance, reduced security risk access to highly skilled and reliable labor, fast execution schedules and very competitive costs.

This presentation will provide information with specific examples of the technical approaches to implementing gas treating and NGL recovery projects based on modularized packaged plant execution relative to the traditional stick-built site fabrication. The presentation will also include a case study based on a recent modular-based gas

OPTIMUM OPERATION OF COMPLEX COMBINED HEAT AND POWER SYSTEMS OF PARALLEL GAS FACILITIES
Manu Al-Owaidh; Dhaifallah Al-Utaibi; Abdullah Ghazal
In the oil and gas industry, the energy demands of heat, steam, power and fuel is highly dependent to the oil or gas processed by the facility. The utilities' system design for those facilities normally built to account for the maximum operating rates. However, the plants sometimes operate at partial loading and because of the operate at minimum loading resulting to having some wasted steam passing over fin-fan condensers. Current models for optimizing the operation of utilities' systems (Combined heat and Power Models) of a facility were being developed to look at the available operational modification changes in a facility yields to better performance, but in the partial loading the operational modifications are limited and sometimes not available. Partial loading leads to high energy consumption and wasting of valuable energy even with using optimization tools sometimes. In this paper, a new optimization technique is being introduced so that the overall energy consumption for the whole system of parallel facilities would be minimized. The idea here is basically extending the boundary of the optimization problem from a facility level a lone to optimizing a system of similar facilities. In house models were being built to come up

SMART DESIGN FOR HIGH CO2 REMOVAL FOR NATURAL GAS PRODUCTION
Gary Powerbank-Gas Processing Shell Global Solutions, NETHERLANDS
Recent Oil and Gas discoveries provide an increasing outlook of gas fields containing CO2 content between 10 mol % to as high as 70 mol % CO2. The gas needs to be treated for managing CO2 emission and to fulfill treated gas specification for sales gas or for LNG production. The increasing amount of CO2 content in newly discovered gas fields requires smart designs to minimize CAPEX/OPEX while adhering to emissions requirements. Amines and membranes are commercially available technologies for CO2 removal. However, membranes alone can only do bulk CO2 removal and cannot achieve low CO2 specifications (certainly not deep CO2 for LNG specifications). So membranes will often need an amine unit meeting the CO2 specification as a polishing step.

For this paper, a case study based on amine technology will be discussed. The gas contains high CO2 (~20 mol %) which will feed a LNG plant downstream. The treated gas specification is the typical required LNG specification of 50 ppm Amine technology is a well-proven process for CO2 removal and capable of meeting these stringent specifications, but comes with high CAPEX and OPEX at these increased levels of CO2. In this study a smart design, which involves a pioneering approach, was undertaken
DEACTIVATION MECHANISM OF TITANIA CATALYST
Mansour A. Al-Shafei, Saudi Aramco
Catalyst deactivation is one of the well-recognized phenomena in the petroleum and chemical processing industries. Identifying the root causes of this phenomenon is an important factor to enhance catalyst efficiency and prevent undesirable failures. In this study, state-of-the-art instruments were utilized to investigate the causes of catalyst deactivation that led to the replacement of the one of the sulfur recovery units in a Saudi Aramco gas plant. Titania catalysts have been examined to determine the inherent deactivation mechanism and also to find out the possibilities of its curement. Understanding the root cause of the deactivation is mandatory for field engineers to minimize future catalyst deactivation. The collected data analysis revealed that the deactivation mechanism occurred to the Ti catalyst due to irreversible chemical phase transformation of the catalyst caused by temperature runaway in the catalytic converter.

ACHIEVING SUSTAINABLE HSE EXCELLENCE IN INDUSTRY
Marlene Jane van Vuuren, ORYX GTL-Ras Laffan, Qatar ORYX GTL
This paper describes the implementation of an operating mode initiative that was applied at NGL Recovery Plant (470) during its turnaround period for 37 days. This initiative was aimed to minimize the oil production losses as well as the Master Gas System operations distraction. Qatar associated gas is processed only at Plant (BGP). Therefore, any outage in Plant 470 will result in one of two scenarios; either the shutdown of Qatif associated gas to the Master Gas System (MGS), and avoid consuming 17,000 barrels of oil equivalent (BOE) per day during peak summer demand. This was achieved by implementing modifications that allowed for de-bottlenecking the sulfur recovery units (SRUs) by replacing the existing conventional underground sulfur seal with an above ground seal technology. This paper includes background information about the encountered gas processing limitation and a description of some novel Velocity Spool (VS) system applications in gas fields. The applications of this technology are not limited to boosting production. It can also save considerable capital and operating costs associated with well intervention. This paper provides details of some novel Velocity Spool (VS) system applications in gas fields. The applications of this technology are not limited to boosting production. The system has also been used successfully to revive liquid loaded wells, and eliminate the need for expensive wellhead compressors. References to recent field examples of this technology in the Middle East are covered in this paper. Further potential applications of the system operating in conjunction with other artificial lift methods are also discussed. The paper also addresses the economic aspects of the technology applications by giving an indication of the payback periods that can be achieved from the added revenue.
For the first time since the commencement of GPA’s Annual Technical Conference a panel-session was held to discuss ideas, current practices and address the issues faced by the oil & gas industry. There were 5 panelists selected to host the panel session under the theme “Effective Deployment of Technology in the Gas Industry”. The panelists were:

- Worley Parsons – Dr. Helmy Andrawis
- Shell – Dr. Marja Zonnevylle
- General Electric – Mr. Brad Tomer
- UOP-Honeywell – Mr. Naji Abou Chedid
- BASF – Dr. Jens Rudolph
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Filtration & Separation

- Amine Sweetening Systems
- Black Powder Removal
- Catalyst Production
- Contact Towers
- Glycol Dehydration Systems
- Inlet Gas Plant Protection
- Mercury Recovery Units
- Sulfur Recovery Units
- Turbine Fuel Gas
- Water Renewal

Filtration & Separation Experts in:

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- Sulfur Recovery Units
- Turbine Fuel Gas
- Water Renewal