



IN BRIEF

ISSUE 1 APRIL 2012

GAS PROCESSORS ASSOCIATION EUROPE

THE INCORPORATION OF GPA EUROPE

By David Weeks, Keith Thomas, Martin Mayer and Jon Lewis

During 2011, it came to the attention of the Management Committee of GPA Europe that the established form of the organisation could leave its members open to potential liability in the event of accident or contractual failures and efforts were made to assess the size of the problem and how this could be minimised.

Since the merger of GPA (European Chapter) and the GPSA Europe, each of which had been originally formed in 1983, GPA Europe has been run essentially as an unincorporated, non-profit making association. For ten years this had been perfectly acceptable, but the association was becoming increasingly aware of the movement within industry to provide excellence in governance and recognised the ever-increasing tendency towards litigation as a solution to any dispute that might arise. At the recommendation of the forward-looking 2020 Sub-Committee, GPA Europe was also entering a period where contracts with organisations other than the simple forms of relationship with, for example hotels for the operation of conferences, were being considered. It was whilst reviewing one such contract with a legal adviser that the Committee were advised that

since the GPA Europe was not a corporate body, in the event of any dispute arising out of the contract, the entities who would most probably be held to account would not be the GPA Europe itself, but its individual and corporate members.

Legal advice

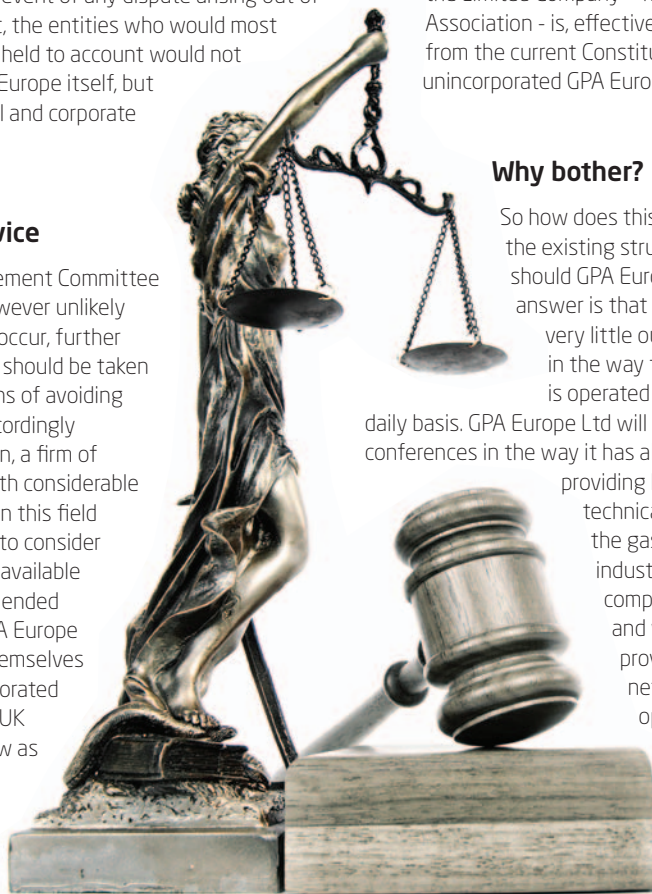
The Management Committee felt that however unlikely this was to occur, further legal advice should be taken on the means of avoiding this risk. Accordingly Hill Dickinson, a firm of solicitors with considerable experience in this field were asked to consider the options available and recommended that the GPA Europe establish themselves as an incorporated body under UK Company law as a "Company Limited by

Guarantee". This designation is appropriate for organisations such as the GPA Europe and is widely used by charities and sports clubs. Essentially, the company is structured under the law as one where the members of the company all have a defined and very limited liability, in the event of the organisation failing. The company is operated under the rules of the UK Companies Act, by a Board of Directors, and must comply with certain clear rules that that compliance imposes. The constitution of the Limited Company - its Articles of Association - is, effectively, no different from the current Constitution of the unincorporated GPA Europe.

Why bother?

So how does this differ from the existing structure, and why should GPA Europe bother? The answer is that there will be very little outward change in the way the organisation is operated or run on a daily basis. GPA Europe Ltd will continue to run conferences in the way it has always done, providing high quality technical papers on the gas processing industry at very competitive prices and will continue to provide excellent networking opportunities for its members.

continued page 19 >



INSIDE



P4-11 PRAGUE

Reports from the 2011 Annual Conference in Prague and highlights from the Companions Tour



P12-14 LONDON

Details from the Knowledge Sessions and Technical Conference in London, November 2011



P15-17 CHAIRMAN'S REPORT

Chairman David Weeks on a year of challenge and change for GPA Europe



ABB Consulting. Safe, reliable, efficient operations.



Oil and Gas operators aiming to achieve operational excellence in the face of ageing assets, harder to reach reserves, cost pressures and skills shortages, often require expert assistance. ABB Consulting offer the oil and gas industry expertise in; industrial energy efficiency, inspection, specialist functional engineering, integrity management, operations improvement, process safety, projects services, technical software and technical training. We benefit customers by reducing risk, optimising cost and improving manufacturing efficiency. www.abb.com/consulting

ABB Consulting
Tel: +44 (0)1925 741111
E-mail: contact@gb.abb.com

Power and productivity
for a better world™ **ABB**

CCS DEAD OR SLUMBERING?

By David Weeks, Chairman, GPA Europe

In November 2007, the then Labour UK government launched a competition for the first commercial scale UK carbon capture and storage demonstration project based on post combustion capture technology. The project would be built and operating by 2014 and ensure the UK role as 'a world leader in bringing this globally important technology for tackling climate change'. It was expected that thousands of new UK employment opportunities would be created through the export of proven post combustion capture technology and expertise to the booming, emerging economies of the Far East, China and the Indian subcontinent. Worthy ideals! Lofty ambitions!

Four years later, these plans are in ruins as three of the four short-listed projects withdrew from the attritional competition. The final remaining project in the one-horse race, Scottish Power's Longannet scheme, foundered on the £500 million funding gap between the estimated project cost (£1.5bn) and the UK-coalition government's £1bn support package.

Within the EU there are plans for six CCS

projects by 2014 with the EU committing funding from the New Entrants Reserve of between €100 million and €180 million to each. If, however, the UK experience is repeated then this level of funding seems insufficient to bridge the gap between cost and economic viability. It seems probable therefore that some of these EU projects may also sink without trace on the reef of economic reality.

So what is the future for carbon capture and storage?

Phase 3 of the EU Emissions Trading Scheme starts on 1st January, 2013, when allowances to emit CO2 will begin trading. In the short term however this scheme is unlikely to drive up the cost of carbon to the point where CCS projects are economically sustainable. Longer term, as the number of annual emission allowances is scaled back, carbon costs will rise.

In the meantime, CCS remains in the safe hands of Oil and Gas processors. Statoil's Sleipner and Snohvit facilities in Norway continue to inject CO2 recovered from gas processing operations, as does the Sonatrach/bp/Statoil In Salah plant in Algeria. In Australia, the Chevron-operated Gorgon LNG plant will inject 5 million tonnes of CO2 back underground. The CCM project at the Mongstad refinery in Norway has been resurrected and seems destined to be another benchmark CCS project to remind the public that where there's a will, there's an economic way.

While the Power industry struggles to come to terms with carbon-free generation and many nations take their first tentative steps towards limiting emissions, oil and gas producers continue to blaze the trail for others to follow. The experience and expertise gained now with CCS technology will be the currency for future prosperity when clean coal power generation is finally accepted by the wider world.



David Weeks

In Brief editor:

Claire Haycock
01782 744561
07967 113119

GPA Admin Office

GPA Europe,
132 Chantry Road,
Disley, Stockport,
Cheshire SK12 2DN,
United Kingdom
T: +44 (0)1252 625542
F: +44 (0)1252 786260
E: admin@gpaeurope.com
W: www.gpaeurope.com
Contacts:
Sandy and Anne Dunlop

Publisher

Ten Alps Publishing
Trelawney House
Chestergate
Macclesfield
SK11 6DW
T: 01625 613000

Advertising

Sarah McGuire
T: 0845 3082491
01625 667748
M: 07514 922497
E: sarah.mcguire@tenalpspublishing.com

A NEW LOOK FOR THE GPA MAGAZINE

GPA Europe would like to express its sincere gratitude to Nick Amott of Fluor Ltd for his sterling contribution to the organisation as "In Brief" editor since 2003. After so many years in this time-consuming role, Nick decided it was time to hand over the reins.

We are pleased to announce that Claire Haycock has agreed to take over editorial responsibilities. Claire is employed as Proposals Manager at Koch-Glitsch UK, and attended her first GPA Europe conference in Oslo in 2006. There, she found GPA to be a very welcoming and friendly organisation (thanks to Don and Wendy Cooney, Sandy Dunlop et al) and has enjoyed participating in several conferences and technical meetings since, including co-presenting a Knowledge Session in Paris in February 2010. She would now like to further her involvement in GPA Europe through the magazine editor's role.

The change in editor coincides with the significant step of the organisation's

incorporation, as well as the decision to employ Ten Alps Publishing to produce our bi-annual magazine. To signify what we hope is the start of an era as a renewed and re-invigorated organisation, Ten Alps Publishing has overhauled the design of "In Brief", and we hope you agree when reading this first edition that the results are very impressive!

As part of this change, we are also inviting a limited amount of advertising within the magazine. This will be managed by Ten Alps Publishing, but if you are interested in advertising in the magazine, which is distributed free to all GPA Europe members, please contact the GPA Europe administration office at admin@gpaeurope.com for further details.

Despite pooling our collective wit and wisdom, we have so far been unable to reach a consensus for a new name for the magazine that is both original and in keeping with the ethos of the GPA organisation. So "In Brief" it remains for the time being! If any of our readers is filled with inspiration for a new title, then we invite you to contact the GPA Admin office with your ideas.

ANNUAL CONFERENCE PRAGUE

THURSDAY, 22ND SEPTEMBER 2011 • MORNING SESSION

The GPA Europe Annual Conference 2011 was held at the Prague Marriott Hotel in Czech Republic on the 22-23rd September 2011. With an interesting programme of papers, a site visit, and a fabulous venue, the meeting attracted over 130 delegates from oil & gas Operators, Engineering Contractors, Suppliers and Consultants from UK, USA and some 15 other countries as far away as Malaysia.

The conference consisted of one and half days of papers, eighteen in total, on gas processing topics with the majority in NGL, LNG and gas treatment. Also provided was a tour for the delegates' companions to Prague's popular tourist attractions on 22nd September 2011, and a site visit to RWE's Hajé Gas Storage facility as an alternative to the second half day of papers on 23rd September 2011. Sponsors for the Conference included ABB for the Welcome Reception and BASF for the Conference Dinner.

Keynote opening speech

The conference was opened with a keynote speech by the President of US GPA, Mike Heim of Targa Resources. Mike provided an uplifting prospect for gas processing by describing a significant reversal in the last six years of US gas production, from declining, through self-sustaining, to even exporting, with developments of US shale gas stimulated by enhanced techniques in drilling, use of long reach horizontal wells, fracking etc. Resultant low gas price combined with high liquids price has resulted in gas processing and fractionation plant additions, expansion of chemical plants, new pipelines and prospective conversion of LNG import to export terminals. The role of the GPA is key in design and operation of gas treating plants, minimising green house gases and safety.

IPORSM for NGL Recovery - Bridging the Performance Gap

The Technical paper session of the conference was opened by Robert Huebel of Randall Gas technology, with a talk about IPORSM for NGL Recovery - Bridging the Performance Gap (co-author Michael Malsam). Robert discussed how the C3 refrigeration process has been handicapped by the -37°C limit of C3 refrigerant to give recoveries of approximately 20-40%



Robert Huebel

of C3 and no C2 recoveries. In the IPORSM process, the conventional C3 refrigeration is supplemented with an open loop refrigeration using deethaniser overhead liquid as a multicomponent refrigerant - this achieves lower temperatures and upto 99.9% C3 and 88% C2 recoveries comparable with turbo-expander processes. Robert presented two case studies showing the benefits of IPORSM in CAPEX/OPEX reduction, or additional revenues in small/medium scale applications with low pressures and moderate to rich feed gases.

Gas Plant in a "Bottle"

This was followed by John Wilkinson of Ortloff Engineers Ltd, who presented a paper on the Gas Plant in a "Bottle" concept, or GPB (co-authors Kyle Cuellar, Joe Lynch, Scott Miller and Hank Hudson of Ortloff Engineers Ltd,



John Wilkinson

and Andrew Johnke and Larry Lewis of SME Products LP). Perhaps the most innovative extension of the turbo-expander (T/E) process in the last decades, John explained that their GPB involved fitting the two demethaniser side reboilers in the gas sub-cooled (GSP) T/E process for ethane recoveries within a heat and mass transfer (HMT) module in the demethaniser bottom, with gas/gas sub-coolers in the demethaniser overhead sections. This concept avoids significant external piping and reduces column internals, whilst the "run back" (dephlegmator or refluxing exchangers) gives closer fit continuous heat extraction resulting in better fractionation. In comparison to equivalent GSP, the GPB results in 6-8% lower compression power, 22% lower CAPEX and significant reduction in plot layout. John continued to astonish the audience with

pictures of the construction of their first GPB design currently in progress for SME Products Ltd.

CDR Offers a New Approach for Gas Processing in Remote Locations

Bucking the trend of NGL recovery, Johnson Matthey's paper, CDR Offers a New Approach for Gas Processing in Remote Locations (co-authors Peter Carnell and Stephen Catchpole) delivered



Bob Green

by Bob Green next described their catalytic de-enrichment (CDR) process which converts NGL components into methane. Seen as an option for stranded gas development e.g. floating LNG, CDR avoids issues of safety and CAPEX associated with the production and storage of NGL components on ship, the provision of separate NGL offloading, and shipping logistics. With over 100 plants installed, the chemistry of the Ni based catalyst, ethane+ conversion to methane process is well proven. The process involves 3 steps: desulphurisation (to protect the catalyst); CDR reaction (at 300°C); and a methanator converting ethane to methane and CO₂. Bob added that the Pt/Rh catalyst-based process, now licensed by Davy Process (part of the Johnson Matthey Group), gives additional benefits i.e. a smaller reactor, moderate operating temperatures, no methanation step, and uses water saturation.

Small-scale Experiments on Natural Gas Expansion with Solid Freeze-out

After the morning coffee break, Karin Hald of the Institute for Energy Technology (IFE), Norway, described the



Karin Hald



A large and attentive audience

experimental work done on the pressure and temperature conditions under which freeze-out occurs in the paper Small-scale Experiments on Natural Gas Expansion with Solid Freeze-out (co-author M.Langsholt). The research group have built a unique 100 litres experimental rig that can test freeze-out up to 165 bar and as low as minus 165 °C. The rig can also be used to investigate the effect of nozzle type and the distance from the nozzle in which freeze-out occurs, and pictures can be taken of actual freeze-out. Several results were discussed: the effect of distance reduced deposition by 25%; the nozzle type made a small difference; and C6 freeze-out could not be successfully measured. The rig is currently being modified for tests on CO₂ pipeline flow and CO₂ pipeline depressurizing to feed data into OLG.

High-fidelity Dynamic Modelling of Depressurizing Vessels Helps Improve Safety and Reduce CAPEX

With three example applications, the fifth paper of the conference entitled High-fidelity Dynamic Modelling of Depressurizing Vessels Helps Improve Safety and Reduce CAPEX (co-authors James Marriott and Zbigniew Urban) was presented by Apostolos Giovanoglou of Process Systems Enterprise Ltd (PSE). The paper discussed their relief and depressurizing modelling tools capability to predict wall temperatures, flare velocities and back pressures. Modelling of depressurizing (blowdown) of compressor loops provides the



Apostolos Giovanoglou

transients in topside pipe and equipment. The last example discussed how low the temperature drops along pipework. PSE tools are able to make more complex analyses of actual systems to take into account piping isometrics, transient conditions and liquid dropout.

Strategies for Reducing CO₂ Emissions from Gas Treating Facilities

The last paper of the morning, by Scot Northrop of ExxonMobil Development Company, discussed Strategies for Reducing CO₂ Emissions from Gas Treating Facilities. Focusing on the individual sour gas processing building blocks, the paper listed opportunities in each process for efficiency enhancements, fugitive emissions minimisation, and flare reduction. The main highlights were efficiency improvements in acid gas removal (AGR), acid gas enrichment (AGE)

ability to track liquid drop-out and collection at low points where minimum temperatures are realised. The modelling of pressure built upstream of choke valves during well start-up can lead to lower temperature

and wet tail gas treating (TGTU) units as a result of optimum solvent selection and circulation, CHP systems and let-down turbines. For sulfur recovery (SRU), heat recovery from the condenser and use of reheat steps are common options although acid gas injection (AGI) is a better choice for remote areas where safety considerations permit. Similarly for the incinerator, use of catalytic oxidation is an option where aromatic and CO₂ levels permit. For fugitive emissions and flare reduction, use of IR camera and acoustic testing provide solutions to minimise losses and flare emissions across the different sour gas processing blocks.

The morning session ended with a presentation by DMG on their proposal to hold a "European Gas Processing Show" with GPA Europe, as discussed in this edition of In Brief. The subject provided an additional topic for healthy debate at the lunch table where expertise in "musical chairs" was also an asset!

Report by Murtaza A Khakoo, BP Exploration, Sunbury



Scott Northrop

ANNUAL CONFERENCE PRAGUE

THURSDAY, 22ND SEPTEMBER 2011 • AFTERNOON SESSION

Using SELEXOL™ Solvent to Advantage - A Discussion of Various Situations and Flow Schemes

After a hard networking lunch, the afternoon session commenced with a paper presented by Dow Chemical Canada's subject matter expert on SELEXOL™ Solvents, Jack McJannett. Jack's paper entitled Using SELEXOL™ Solvent to

Advantage - A

Discussion of Various Situations and Flow Schemes served to reintroduce the SELEXOL™ solvent to the audience, and describing detailed design and operational information on applications not typically found in earlier published studies (which had focussed on syngas treatment).

An introduction to the SELEXOL™ solvent described the dimethyl ether of polyethelene glycol as a physical solvent, which has the capability to remove acid gases and other contaminants from gas streams. The physical nature of the solvent allows removal of much higher amounts of acid gas when compared to amines, as it requires relatively less energy for regeneration. The SELEXOL™ solvent is pH neutral, of low viscosity, low vapour pressure and forgiving in terms of thermal degradation.

The SELEXOL™ solvent compares favourably to amines for CO₂ removal when the partial pressure of CO₂ is >70psia, the concentration of C₂+ in the gas stream is <5mol% and the required treated specification of CO₂ in the product stream is >2mol%.

A number of typical SELEXOL™ solvent applications were presented, encompassing high CO₂ Removal from Natural Gas, CO₂ Removal in Ammonia Plants, H₂S, CO₂ and COS removal from Gasifier Product Streams, and H₂S + CO₂ removal from syngas units. The features of each application were discussed, and comparisons made with amine CO₂ removal processes.

Two further applications were touched on: Mercaptan Removal from Molecular Sieve Regeneration Gas, due to the high solubility of mercaptans in the SELEXOL™ solvent compared to the solubility of methane; and Contaminant Removal from Landfill Gas, where the SELEXOL™ solvent benefits due to its high oxygen tolerance and ability to remove siloxanes.



Jack McJannett

Stable Operating Limits in Amine Treating Units

Next up, annual conference stalwart Ralph Weiland of Optimized Gas Treating educated the conference about Stable Operating Limits in Amine Treating Units (co-author Nathan Hatcher). Ralph first reminded us of some common design conventions pertaining to amine unit design i.e rich amine loading, maximum line velocities, contactor tower hydraulic limits for packed or trayed designs, temperature and pressures, and the limitations imposed by anticipated degradation and corrosion.

Using the results of simulations undertaken using the Protreat™ mass transfer rate-based simulation tool, Ralph proceeded to demonstrate the envelope of stable operability limitations in amine systems.

Three case studies were presented using common treating generic solvents: MDEA, MEA and aMDEA.

Simulation results were presented to show how acid gas breakthrough can occur fairly rapidly as solvent circulation is reduced. For a low reactivity solvent e.g. generic MDEA, the response is seen to be gradual and controllable. However, for the more reactive solvents, e.g. MEA, aMDEA, the performance at reduced flow can set up unstable areas of performance, which can result in a sharp increase in product CO₂ content

The paper promoted the requirement for a thorough understanding of the mechanics of the system in order to determine methods to identify when a plant may be about to reach its stability limitation (e.g. by provision of internal tray temperature measurement or other such indicators).

Zero Emission & Carbon Capture in Coal Gasification and IGCC Plant

Taking us up to the coffee break was Nick Amott, (co-authors John Y. Mak and Curt Graham) from Fluor Ltd, who talked about Zero Emission & Carbon Capture in Coal Gasification and IGCC Plant.



Ralph Weiland

The paper was split into two parts.

Firstly, Nick discussed the debottlenecking of Chinese Fluor solvent-based propylene carbonate (PC) units. China has over 500 units for producing ammonia and UAN (urea / ammonium nitrate liquid fertiliser) using home-grown PC units operating at ambient conditions for CO₂ removal. The paper demonstrated that by operating the absorption at minus 12°C instead of 36°C with the addition of a refrigeration unit on PC circulation; by dehydration of feed gas; and by using an air dryer, the capacity of the PC units can be doubled. CO₂ sequestration can be augmented by addition of compression.

In the second part, Nick described the concept for a carbon capture ready coal gasification plant executed in two phases, initially producing CO + H₂ for fuel power turbines and later installing a shift reactor to convert CO to CO₂. The CO₂-rich syngas is then treated using the Fluor EconosolvSM process. Flow schemes, stream balances and process performance for both phases were detailed.

Sour Water: Where it comes from and how to handle it

Following the coffee break, Luke Addington stepped up to present Sour Water: Where it comes from and how to handle it (co-authors Carl Fitz, Kevin Lunsford, and Lili Lyddon, Bryan Research and Engineering, Inc. & Dr. Ing. Mariana Siwek, Verfahrenstechnik und Automatisierung GmbH).

Despite seemingly digressing from the gas processing theme, Luke's thorough paper was one of interest for almost all gas processing engineers present, as it reflected a problem experienced in gas plants time and time again.



Nick Amott



Luke Addington

The presentation began by introducing the delegates to the sources of sour water, typical contaminants and some common disposal techniques in upstream and refinery services.

Luke recalled how GPA-sponsored research had been used to develop electrolytic simulation models (the GPSWAT model As well as other commercial simulation products such as ProMax), which allow reasonably accurate modelling to be performed.

Luke explained that by understanding the variables, engineers would be able to optimise the design and operation more effectively.

Options for sour water stripper configurations were reviewed and a method to optimize stripper operation by finding the most efficient operating parameters was presented. These included single or double columns for increased product purity, addition of acid or caustic for improved performance, refluxed or non-refluxed columns to mitigate water in the overhead gases, condenser or pump-around and the effects on overhead composition, and reboiler or direct steam injection, or a combination of these. Luke also presented some discussion on column efficiencies based on operating data.

Removal of Divalent Salts from Aqueous MEG Solutions in a MEG Reclamation Process

Continuing on the liquid treating theme, Simon Crawley-Boevey of Cameron Process Systems (co-authors Brian Messenger and Dan Phelps) presented Removal of Divalent Salts from Aqueous MEG Solutions in a MEG Reclamation Process.

Salt contamination of MEG regeneration equipment used for hydrate inhibition in gas production pipeline is a common problem. MEG reclamation technology is being used more frequently to remove salts and other solids (corrosion products and sand) whilst also

removing the water to achieve the required product glycol purity, in a reliable operation with good availability. Simon's presentation introduced the delegates to the variety of salts prevalent in formation waters and educated in the complexities of the treatment methods required to remove them. The divalent salts (predominantly Calcium, but also including Magnesium, Barium, Iron and Strontium) were highlighted as requiring additional treatment in order to facilitate removal. Simon touched on pH control, solubility, crystal structure/morphology and experience both from the lab and from real MEG systems.



Simon Crawley-Boevey

Simon presented two case studies for calcium removal: (1) a continuous process with pre-treatment of the full MEG stream; and (2) a batch process operating

on the recycle MEG stream requiring smaller equipment. The studies demonstrated that dependant on the particular application, either system could be applicable.

It was refreshing to be presented with a new technological development and understanding of a process which has long seen operating issues in our industry.

Molecular Sieve Dust Generation Problems in a Natural Gas Processing Facility

The day's papers were brought to a close with a presentation by Ahmed Adel of United Gas Derivatives Company, Cairo, Egypt (co-author Govind Kasturi) entitled Molecular Sieve Dust

Generation Problems in a Natural Gas Processing Facility.

The UGDC owned and operated Natural Gas Liquids (NGL) extraction plant located at Port Said, Egypt had experienced a problem with high dust generation arising from the molecular sieve dehydration package. After a debottlenecking exercise, the plant capacity was increased from 1100 MMSCFD to 1300 MMSCFD and the molecular sieves charge was changed to a different type.

Ahmed explained the troubleshooting process that UGDC had undertaken to identify and rectify the issue. The failure investigation methodology was based around using a 'fishbone' diagram to brainstorm and identify the potential causes for the dust problem. Six areas of investigation were identified: feed gas contamination; poor coalescer performance; incorrect regeneration temperature ramping profile; uneven flow distribution across the bed; poor bed sealing mechanism; and poor molecular sieve characteristics. The investigations into each of these six areas were described and it was concluded that the majority of the dust issue was arising from poor sealing of the support grid, with a significant contribution arising from the use of a non-optimal regeneration temperature ramping profile. Remedial actions were undertaken and the unit has reverted to satisfactory performance.

This brought a very informative afternoon session to an end.

Report by Jason Frost, Offshore Design Engineering



Ahmed Adel



The Prague Conference speakers and moderators



COMPANIONS TOUR PRAGUE

PRAGUE CONFERENCE • BY ANNE DUNLOP

The companions' day proved to be very popular with 34 registered participants, but this did cause a little problem as the morning was planned as a walking tour of Old Prague. We broke into two groups, each with one of the two male companions, Rob and Jes, who we hope were made to feel welcome. Our guides, Edita and Vera showed us the same sights but in a different order.

So, clutching our guides to Prague kindly provided to us by BASF SE, we began with a short walk from our hotel to the Powder Tower. Originally known as the Mountain Tower, this is the gateway to the Medieval Royal Route which leads through the Old Town over the Charles Bridge to the Castle. This Gothic tower was built in 1475 but, ever since the structure was used as a gunpowder storage space in the 17th century, it has been known as the Powder Tower. Very close to the tower our attention was drawn to a Black Madonna Statue on the corner of a building. This building is imaginatively called the House of Black Madonna, and is now used as a small museum of Cubism. From there, looking across a large square, we could see the State Opera Building which dates back to the late 19th century.



GPA Tour Group 1

Continuing along the original Royal Route we soon found ourselves in the Old Town Square - a journey back in time 600 or 700 years. This is one of two main squares (Wenceslas Square being the other) and with its ancient buildings and magnificent churches this is one of the most beautiful historic sites in Europe. Dating from the 12th century, the Old Town Square started life as the central marketplace for Prague. Over the centuries, buildings of Romanesque, Baroque and Gothic styles were erected around the market, each bringing

with them stories of wealthy merchants and political intrigue. In the centre of the square is the Jan Hus statue, erected in 1915 to mark the 500th anniversary of the reformer's death. Saint Nicholas Church and the Church of Our Lady before Tyn can also be found here but the main tourist attraction is the Old Town Hall with the Astronomical Clock. In the top part of the early 15th century clock, the 12 apostles appear every hour between 9am and 9pm. The bottom part was supplemented with a round calendarium including the signs of the zodiac.

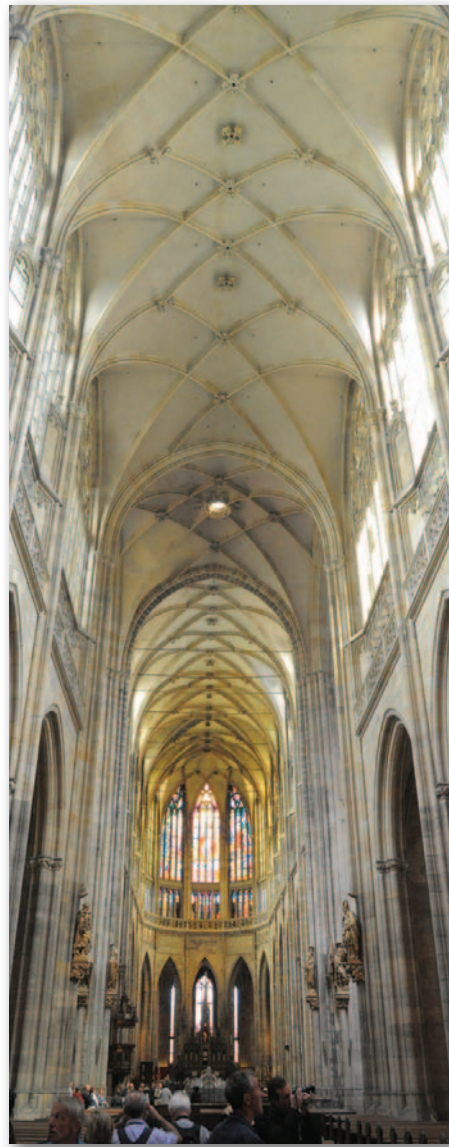
The square was also filled with souvenir and food stalls with people sitting back to soak up the atmosphere over a coffee or cool beer at one of the pavement cafes lining the square.

On route to the Vltava River we entered the Jewish Quarter. Its history dates back to the 13th century when the Jewish community were ordered to settle in one area. In this area, six synagogues can be found including the Old-New Synagogue and the Spanish Synagogue plus the Jewish Town Hall, the Jewish Museum and the Old Jewish Cemetery. I was fascinated to see the clock with Hebrew numbers, which runs anti-clockwise! We finally reached the river and the Charles Bridge. This bridge is very well known especially for the thirty sculptures and sculptural groups of the saints set on the bridge piers.

Our morning over and some sore feet starting to appear, we made our way back to the Old Town and the Havelak Restaurant. Here we were given a very traditional Czech-style 'Eat as much as you can' traditional cuisine buffet.

With full stomachs we had time to relax as a coach took us through the countryside to Kutna Hora. Our journey there was far from boring as Edita and Vera got into a comedy double act that entertained all. Kutna Hora, as a town, began in 1142 with the settlement of the first Cistercian Monastery and by 1260 had become the Czech second city and centre for silver mining. It is now a UNESCO World Heritage site.

Love it, hate it or just intrigued by it, our first stop was at the Chapel of All Saints (otherwise known as the Bone Church). What everyone wants to see are the decorations made by Frantisek Rint commissioned in 1870. His



creations include a coat of arms of the local aristocratic Schisarzenberg family and a chandelier that contains every bone in the human body. From here, we drove around the town to Saint Barbara's Church. Begun in 1388, this large and beautiful Gothic Cathedral has three tent-like spires and, inside, five naves. We then walked back through the town to where the coach was waiting to take us back to the hotel.

It was a long day with lots of walking but I hope everyone will agree it was worth it. My hat goes off to the ladies who were not based at the main hotel as they seem to have been able to get ready and be back for the conference dinner before me. I look forward to seeing you all (and more) in Berlin where I promise I will not let Sandy plan such a full programme!



ANNUAL CONFERENCE PRAGUE

FRIDAY, 23RD SEPTEMBER 2011 • MORNING SESSION

The Friday morning session was much better attended than anticipated with nearly 80 people crammed into a much smaller room than the previous day. John Sheffield opened the session by apologising on behalf of the GPAE Management Committee for the congestion, whilst arrangements were being made to increase the space available by opening up the adjacent room.

Challenges of Qatar Mega LNG projects

The first speaker was Mohammed Ould Bamba of Technip who enthusiastically presented a packed paper on the Challenges of Qatar Mega LNG Projects (co-authors Nathalie Millot and Herve Mahe), for which 30mins was just not enough. Main challenges described included: worldwide locations for design and procurement (3 centres + worldwide supply); human factors (200,000 people, 86 nationalities, 75000 personnel on site); security and safety (mob/demob, asset protection, strikes); camps (14 in total consuming 10te rice/day and 12,000 chicken/day); logistics and material handling (200,000 Twenty feet equivalent unit (TEU) containers/day); technology (APX); construction (62" lines, construction material availability including sand!); commissioning and start-up. Numerous pictures and statistics showed the sheer scale of the undertaking and how the challenges were addressed and overcome.



Mohammed Ould Bamba

TOTAL's Approach to Selecting the Liquefaction Process for F-LNG

The second paper on TOTAL's Approach to Selecting the Liquefaction Process for F-LNG (co-author Elise Morand) was presented by Denis Chrétien of Total and reviewed a



Denis Chrétien

recently completed study on the selection of processes for Floating LNG production. Denis recapped several challenges of FLNG, such as ship-to-ship transfer of LNG, sloshing in tanks, process safety and the liquefaction process for offshore. The paper focussed on comparing two FLNG liquefaction process options – the Dual Mixed Refrigerant (DMR), and the Nitrogen pre-cooled processes. In addition to comparison of process performance, availability and layout, Total conducted extensive safety assessments, examining some 300 hazard scenarios to group into Total defined categories - Catastrophic, Disastrous etc. This showed DMR has 11% and 19% more additional risk to personnel and assets respectively. Total concluded that whilst DMR is more efficient, they would select N₂ based on their comparison criteria, since the overall costs are comparable.

Dual Enhanced Tubes for Large Shell and Tube Heat Exchangers for LNG – A Mature Technology

The third paper moved into a specific development of heat exchanger equipment. Thomas Lang of Wieland-Werke AG and Brigitte Ploix of Technip France jointly presented a paper entitled Dual Enhanced Tubes for Large Shell and Tube Heat Exchangers for LNG – A Mature Technology. The paper discussed the development timeline of their proprietary dual (inside + outside) enhanced surface tubes, GEWA -PB and GEWA-KS, for propane chilling and condensers. The ability to achieve low temperature approaches (2°C instead of 3°C for low finned tubes) realises a 50% saving in area, and potentially a 30% saving in plot length resulting in 20-30% CAPEX saving. These tubes have been used in the propane chilling circuits for the Mega-LNG trains in Qatar, and Wieland have at least 15 further references, including debottlenecking applications as well as some refinery fouling duties.



Thomas Lang and Brigitte Ploix

Integrated Systems - The Key to Unlocking Gas Processing

Staying with the theme of equipment and process development, Daniel Weidert of Chart Energy and Chemicals presented the fourth paper Integrated Systems – The

Key to Unlocking Gas Processing (co-authors Richard Hopewell and Oliver Knight). The paper addressed the subject of integrated cryogenic systems for NGL separation, nitrogen rejection and helium recovery. Chart's strengths in fabrication of cold boxes and low temperature N₂/He recovery plants were described. The presentation discussed PFHE fabrication, cold box assembly and process schemes for air separation, nitrogen rejection units with different options of slip stream LNG production, NGL recovery, liquid N₂ production and crude helium recovery.



Daniel Weidert

Trends in Design of Small LNG Plants

Hans Grossmann of GOC Engineering GmbH then presented a paper on Trends in the Design of Small Scale LNG Plants which provided an overview of the small, distributed LNG business with concepts for integrating with renewable systems such as wind, biogas and energy storage projects. The paper focussed on both technical and commercial aspects and provided a basis for analysing the requirements of all stakeholders in such developments.



Hans Grossmann

Determining LNG Storage Capacity at LNG Receiving Terminals



John Sheffield

David Weeks took over the session chairmanship and introduced John Sheffield to present the final paper, Determining LNG Storage Capacity at LNG Receiving Terminals, which addressed the issues of sizing and verifying

storage capacity at LNG import terminals. John detailed the assessment of LNG storage required, based on the need to offload a full

ship, as well as supplying a given amount of strategic volume (e.g. 2-3 days) in case of ship delay or other interruptions. Where a terminal is used by many shippers, inventory management and sharing becomes a key issue. The paper asserted that you do not need sophisticated programs to develop sharing strategies and proceeded to show a spreadsheet analysis which can allow the development of simple schemes for mutual cooperation between the shippers based on the Quantitative Interval principle.

John Sheffield returned to the chair to thank all of the presented for their excellent presentations and the audience for their enthusiastic participation in what had been a most interesting and enjoyable session.

**Report by John Sheffield,
John M. Campbell & Co**



Discovering more about ABB

GPA Europe site visit to the Háje underground gas storage facility

On Friday morning, the delegates who opted for the site visit congregated in the lobby of the Marriott hotel, where we were met by our host Aleš Gregoroviš of RWE and our interpreter Stanková Jana. We boarded a coach and, after battling against the Prague traffic, we found ourselves heading south into the picturesque Czech countryside.

The Háje underground gas storage facility is located 70 km southwest of Prague near the town of Příbram, known for its mining industry. The site is adjacent to a disused uranium mine and was chosen because of the geology of the region. The plant began storing its first gas in 1998.

The storage cavern is mined into a granite massif at a depth of 960 m. The system of galleries, with cross sections ranging from 12 to 15 square metres, covers an area of 1.5 square kilometres and has a total length of 45 kilometres. The walls of the cavern are unfaced except where loose rocks threatened to collapse into the gallery. Two access shafts from the construction phase were closed off by constructing a pressure barrier. Each shaft is closed off by a pair of plugs between which the gap is filled with water that is maintained under pressure.

The plugs were formed by spraying steel fibre-reinforced concrete onto the body of the plug up to a depth of 10 metres, the middle part of which is circumferentially countersunk 1.2 metres into the surrounding rock. Each end of the plug is lined with steel plate and the



plugs are grouted along their entire length to improve their impermeability. The water-filled gaps between the plugs in the two shafts are connected with each other and to the surface plant by an inter-plug borehole in which the water level is maintained min. 250 metres. The space above the water level is filled with pressurized nitrogen. The inter-plug space pressure is maintained min. 0.5 MPa above the cavern pressure.

Another operating borehole is the drainage well which reaches the lowest point in the gas storage side of the cavern. The borehole is fitted with casing, a riser, and an ejector pump which is used for pumping water from the cavern. Water is removed from the plant by road tanker for treatment and disposal.

The underground cavern is connected with the surface plant by five 9^{5/8}" injection/withdrawal wells. The surface plant is divided into seven sections:

- Compressor room.
- Gas Dehydration by TEG.
- Pipe yard.
- Gas metering and pressure control.
- Electrical power distribution.

- Auxiliary equipment.
- Inter-plug borehole.

Gas is brought to the storage facility by a pipeline from Zvestov, where it is connected to the Veselí nad Lužnicí-Prague pipeline. The gas is compressed to storage pressure by two seven stage Delaval compressors driven by Solar Taurus 70 gas turbines. The same compressors are used to withdraw the gas once the cavern pressure has dropped below the pipeline pressure. The gas is delivered to the Háje-Zvěstov-Prague, Háje-Kasejovice and Háje-Příbram pipelines.

The tour began in the conference room with a video about the construction and operation of the Háje underground gas storage facility. Afterwards we were introduced to our guide Staněk Karel who ably answered the questions from the delegates about the facility. We were then given a guided tour of the surface plant lasting around one hour which finished up in the control room.

Our thanks go out to Aleš, Stanková and Staněk of RWE for providing a very interesting and well organised site visit.

Report by Simon Crawley-Boevey

KNOWLEDGE SESSIONS LONDON

THURSDAY, 24TH NOVEMBER 2011

Compact Heat Exchangers

The November Technical Conference covered technology developments in processes and equipment and featured two Knowledge Sessions. The first was on Compact Heat Exchangers by Robert Broad of Alfa Laval, providing a large audience with a comprehensive overview of the latest developments in compact heat exchangers with particular focus on their significance in natural gas processing. A range of natural gas processing applications was presented to show the type of heat exchanger duties that could effectively employ compact exchangers. Plate heat exchangers are well known to be compact and highly efficient due to their ability to achieve very high heat transfer coefficients. Increasingly, they are being accepted for lean/rich interchanger duties in gas sweetening and dehydration up to 25 barg, as limited by the use of gaskets.



Robert Broad

Semi-welded and all-welded plate exchangers can operate at higher temperatures and pressures and are now being used in many natural gas processes including amine regeneration reboilers, NGL fractionation, propane refrigeration and gas cooling. As with gasketed plate exchangers, semi-welded exchangers operate with true countercurrent flow with temperature differences as low as 1 deg. C (typically for refrigeration duties). Comparisons were made against the thermal performance, space requirement and cost of equivalent shell and tube exchangers to show the advantages of plate exchangers, particularly in debottlenecking applications.

Robert provided many examples on engineering design, installation practices and maintenance of compact heat exchangers with particular reference to fouling mitigation, turndown limits and cleaning.



GPA London networking in action

LNG Compressors & Drivers

Sib Akhtar of M.S.E Consultants Ltd presented the second Knowledge Session on LNG Compressors & Drivers. This presentation examined the compressors and drivers commonly used in base-load liquefaction plants and focussed on the relationship between liquefaction plant capacity, compressor limitations, and driver selection. Sib demonstrated how compressor and driver limitations almost always limit maximum train size, showing a trend of increasing train capacity with time, break points in capacity and how alternative liquefaction technologies were developed and evolved to overcome capacity limitations. Developments in the ConocoPhillips "Optimized Cascade" designs arose from using advancements in GE Frame 5 gas turbines (and having parallel machines) to increase capacity to 4.8 million tonnes per annum. The use of aero-derivative gas turbines on recent plants was noted. Corresponding developments in APCI propane-MR technology to split refrigeration duties and use single shaft gas turbines up to Frame 9 were discussed, along with the AP-X technology which can reach 7.8 million tonnes



Sib Akhtar

per annum of LNG with a nitrogen expander on LNG subcooling duty. Shell and Axens dual mixed refrigerant (DMR) technology (that permits better matching of duty to power in some applications, particularly cold climates) and Linde's Mixed Fluid Cascade (featuring three refrigerant circuits and variable speed motor drives) were also noted. Extensive performance comparisons were made and Sib demonstrated impressive knowledge of what specific technical factors caused limitations in compressor and/or driver capacity.

The presentation revisited the now largely ignored use of power generation by steam turbine that was the basis for earlier LNG plants. The extent of equipment on steam systems has resulted in gas turbines being used for LNG production since the mid 1980s. However, steam systems are reliable and efficient and can now offer the right combination of power and operational speed to take single liquefaction trains to 10 million tonnes per annum. Economies of scale would suggest this is a key issue in reducing LNG plant capital and operating cost, and steam turbines may increase in popularity if train sizes really are limited by power availability.

TECHNICAL CONFERENCE LONDON

THURSDAY, 24TH NOVEMBER 2011



The London speakers

Proteus LNG

Following lunch and the AGM, the afternoon Technical Session commenced with Proteus LNG by Brian Songhurst of E+P Consulting. Natural gas liquefaction (at capacities below conventional base-load) uses heat exchange with a separate refrigerant cycle (either single-phase fluid such as gaseous nitrogen for smaller scale plants and floating applications, or a mixed refrigerant). Proteus LNG eliminates the external refrigerant cycle by feed gas pressure-reduction and condensing of the natural gas directly via a turbo-expander. Between 25 and 40% of the feed gas condenses. The work generated by gas expansion can be used to power the recycle gas compression.



Brian Songhurst

By eliminating the separate refrigeration cycle, the overall equipment count is reduced by 50% and consequently CAPEX is reduced. Thermodynamic efficiency is still relatively high and closer to a Mixed Refrigerant plant than the Reverse Brayton Cycle used with closed

expander cycles based on nitrogen or methane. Therefore OPEX is relatively low.

Proteus LNG technology has been patented and is suited to small-scale LNG plants, in particular small, stranded gas developments, rather than the largest base-load plants where thermodynamic efficiency is very important in maximizing LNG production. FEED studies have developed the layout, provided budget quotes and undertaken HSE assessments. These studies have considered plant capacities from 100 tonne/day to 1 million tonnes per annum, which is about the operational limit of the largest available turbo-expander. The process is ideally suited for small stranded gas developments.

Brian covered the process design, main equipment specifications, layout, modularisation possibilities and costs (CAPEX & OPEX) as well as an HSE overview, with a focus on applicability to offshore liquefaction. All equipment is proven and conventional. A liquefaction cost of US\$ 1.00 was shown.

Compact Gas Scrubbing at High Pressure

Dag Kvamsdal of Cameron Process Systems presented Compact Gas Scrubbing at High Pressure, describing the latest developments in separation of liquid from gas at challenging conditions of high operating pressures, low

operating temperatures and low surface tension, whilst minimizing equipment size and weight. The need for verification using real fluids at real flow conditions was discussed. The traditional "k value" method for separation equipment design is unreliable for predicting the performance of high pressure separators. Dag showed that by experiment and improved modeling including the use of Computational Fluid Dynamics, the performance of advanced vessel internals (that rely on flow direction change and swirl) can be assessed by Cameron for optimized designs. Specifically, the vessel volume is used more



Dag Kvamsdal

effectively by having improved flow distribution. The latest concepts to achieve compact vessels showed how bulk liquid separation inside the traditional two-stage scrubber vessel (as a combined inlet device and separator vessel) provides compact, robust and efficient separation. The presentation also discussed the latest developments with axial flow cyclones to improve separation performance and permit increased gas capacity.



< Use of Membranes for Gas to Liquids Technology

Ruben Rodriguez of Gas2 Ltd. presented Use of Membranes for Gas to Liquids Technology. Gas2 Ltd. is developing a differentiated technology for the conversion of natural gas to liquids (GTL). The technology is based around the development of porous membranes pMR™ (Porous Membrane Reactors) to generate syngas in a Catalytic Partial Oxidation unit, followed by an LTFT (Low Temperature Fischer Tropsch) reactor for the generation of fuels

such as gasoline, diesel and waxes. The porous support structure leads to enhanced performance due to increased mass transfer area. A number of technical attributes were shown that lead to reduced capital and operating costs and footprint. Gas2 GTL



Ruben Rodriguez

technology works with oxygen rich air instead of pure air, eliminating the need for complex and costly air separation units (ASU). No steam is required in syngas generation. Compression between the syngas and FT units can be avoided, thus reducing capital cost compared to conventional GTL processes.

These attributes give Gas2 technologies some distinctive advantages when compared with other GTL processes; - less items, a smaller plant footprint, higher production per ton of installed weight, process simplicity and the flexibility to work in either a utility-poor or a utility-rich environment. The Gas2 GTL process should be competitive in conversion of associated gas (avoiding flaring or reinjection) and in monetising stranded gas. The technology is modular and therefore offers potential for scale-up to large plant capacities.

Application of Divided Wall Column (DWC) Technology to the Gas Sweetening and Dehydration Processes

Stefano Favilli and Luciano Scibola of Sime Srl completed the presentations for the day with Application of Divided Wall Column (DWC) Technology to the Gas Sweetening and Dehydration Processes. Natural gas sweetening and dehydration are normally carried out with successive amine and glycol absorption processes in separate contactors. Sime demonstrated how the DWC technology concept uses one shell with a full dividing wall (totally dividing the column) to perform the two processes in one vessel, resulting in a more compact, modular, lighter and cheaper solution. Examples were presented for a range of cases, and the work performed to identify the mechanical limits of the partition wall technology was shown. The potential to use an internal passageway to send sweetened gas directly to the dehydration section was also discussed and the pros and cons of the technology were identified.



Luciano Scibola



Stefano Favilli

The implementation in one column of both sweetening and dehydration processes could be especially appropriate for offshore platforms or vessels, where space and weight savings are important. DWC technology can also be applied when more parallel sweetening and/or dehydration columns are necessary due to flexibility needs and increased plant capacity.

The overall quality of the Knowledge Sessions and technical presentations provided the large audience with a highly informative day and justified a slightly delayed opening of the free bar to round off the day with further networking opportunities.

Reports by Adrian Finn, Costain

GPA EUROPE CHAIRMAN'S REPORT 2011

By David Weeks

Ladies and gentlemen, colleagues and fellow Gas Processors - welcome. 2011 has been a year of challenge and change for the European Gas Processors Association - challenge because the global financial crisis continues to place conflicting demands on our time and our employers' budgets, and change because new approaches have been tried to promote GPAE and to raise its industry profile for the benefit of the members.

With few visible signs of a rebound from the global downturn, 2011 was nevertheless another solid operational year for the GPA Europe. Membership has grown as a result of initiatives introduced this year and we have organised 3 successful conferences, a Centre of Technical Excellence at GasTech 2011, as well as today's AGM.

For those of you who were unable to visit our conferences, I will briefly summarise the 2011 highlights:

Our February conference was held at the Marriott Hotel in Amsterdam. Attendance was disappointingly low with only 41 registered delegates. The conference theme was "Operations, Maintenance, Reliability and Safety".

We had a full one-day programme of nine technical papers, and on the second day a knowledge session, given by Martin Copp and Allen Walker of PecoFacet, during which we were educated about the intricacies of Coalescing and Filtration. Due to a last minute technical hitch, Martin was forced to delve into the Heath-Robinson book of ingenious engineering solutions to demonstrate PecoFacet's working coalescer. All I can say is that it is truly amazing what can be done with duct tape and a vacuum cleaner!

In March, GPAE returned to Amsterdam to participate in GasTech 2011, where we organised one day of technical papers presented at the GPAE Centre of Technical Excellence in the main exhibition hall of the Rai Centre. GPAE members once again stepped up to the plate with their support and prepared and presented a total of 12 high quality technical papers on different aspects of LNG and gas processing. Our 50-seat theatre was full throughout the day, often with standing room only available around the theatre for additional members of the audience who stopped by to listen. The GPAE stand in the exhibition hall was manned throughout by Sandy Dunlop and his wife, Ann. My thanks go to them and to the many willing GPAE members who gave up some of their time during this busy exhibition and conference to man the stand and promote GPAE.

In May we travelled to wonderful, wonderful Copenhagen, the home of the Little Mermaid. Our spring conference focused on the theme of "Impurity Removal Technologies". With the emphasis very firmly on trace impurities, such as mercury, FeS, mercaptans, etc. rather than bulk contaminants such as CO₂ and H₂S, the 10-paper technical programme described how to treat these minor, but nevertheless troublesome components. On the second day, Costain Energy and Process presented a Knowledge Session on the increasingly common need for Nitrogen Rejection from natural gas. With their considerable expertise in this area of gas processing, Grant Johnson and Tim Eastwood were able to educate an intrigued audience.

Our annual conference in September was held in the beautiful city of Prague, the GPAE's first return to Eastern Europe since the Warsaw annual conference in September 2005. The conference was one of our most successful events with a total of 133 registered delegates from 17 different countries plus 34 accompanying companions.

The traditional 'open' theme of the annual conference was continued this year with a total of 18 papers presented over 1-1/2 days. A full program of 12 papers was presented on Thursday with 6 more on Friday morning for those who chose not to attend the site visit to the RWE Gas Storage

Image courtesy of Helge Hansen and Statoil



Was the AGM really so enjoyable?!

facility at Hajé The Companions Tour remains an integral part of the Annual Conference and feedback suggests that it was once again a thoroughly enjoyable occasion as partners were treated to a guided walking tour of Prague, lunch and an afternoon visit to the old silver mines at Kutna Hora.

We were also pleased to welcome two visitors from USGPA, Mike Heim, the current president and Johnny Dreyer, Director, Industrial Affairs. Mike kindly delivered a welcoming speech on the first morning of our conference, in which he described the dramatic and reinvigorating effect that shale gas is having on the US Gas Processing industries.

Total attendance at our 2011 meetings was comparable with 2010. When viewed against the background of the financial crisis, during a time when companies are looking ever more closely at their conference budgets, it was felt that the numbers of participants at our conferences had held up very well.

I must also say a word of thanks to our 2011 conference sponsors. There is always lots of competition for limited corporate funding, never more so than in the current financial climate. ABB Engineering Services has been a remarkably loyal supporter of GPAA for a number of years and has twice generously sponsored our conferences this past year, in



Christian Streicher receives his award for "Best Paper 2010"

Amsterdam and in Prague. I would also like to offer my thanks to BASF for their sponsorship of the cocktail reception and annual conference dinner and for the companions' gifts which were invaluable for finding our way around Prague.

The generosity of our sponsors allows GPAA to maintain the outstanding value-for-money of its conferences in comparison to more commercial enterprises. Thank you all very much for your continued support.

I have stated on a number of previous occasions that GPAE events do not happen by chance. A lot of planning and hard work goes on behind the scenes to sustain the ethos of the GPAE which is to provide a warm, friendly environment in which to meet and make friends, to exchange ideas and to educate and inform our fellow gas processors.

I want therefore to say a special word of thanks to those who have selflessly supported me in my first year as your chairman.

The GPAE Management Committee meets every quarter to discuss issues of importance to the organisation as a whole and to propose actions or decisions that must be considered by the wider membership at the AGM. To give you a flavour of our meetings, some of this year's key discussions form agenda items for the remainder of this AGM. Jon Lewis, our secretary, faithfully records every promise made and decision taken. Future deniability is therefore not an option! Martin Mayer, our Treasurer, ensures that our finances are accurately reported and audited and remain in good shape to meet both our present and future commitments.

The Program Committee under the chairmanship of Lorraine Fitzwater also meets quarterly to discuss and plan future conferences, to decide themes, to appoint chairmen and to chase, screen and select papers for presentation. It is hoped that the change to a web-based process that has been introduced in 2011 will simplify and facilitate their role and reduce demands on their individual time. Our association's proud and justified reputation for presenting high quality, technical conferences is testament to their successful hard work.

Members of both these committees are all volunteers who give freely of their time, often travelling long distances to attend meetings at times which can never be convenient for everyone. I extend my personal thanks to them, and the thanks of you, the members, for all their contributions over the past year.

I must also thank Sandy and Ann Dunlop, the 'dynamic duo' who constitute the GPAE Executive Administration team. When Don and Wendy Cooney announced their intention to retire from this role last year, there is no doubt that the association lost a keystone. Undaunted by the challenge, Sandy successfully tendered to the Succession Subcommittee for the position and took over the role in November 2010. Less than three months later, Sandy was thrown in at the deep end at our February conference in Amsterdam. I do not believe that it is an understatement to say that the transition in Administration has been invisible and seamless to most members. Sandy assumes most of the day-to-day responsibility for the smooth running of the GPAE, organising conferences, responding to emails, while the rest of us must perform the 'day job'. The current strength of the

organisation is due in no small part to the efforts of Sandy and Ann. On behalf of the members, I would like to thank you for your sterling efforts and I look forward to working with you both throughout 2012.

Lastly, but by no means least, the final group of people who are deserving of thanks, of course, is you – the GPAE membership. Your continued support makes all the hard work worthwhile.

However, with successes there are inevitable disappointments.

The first disappointment this year that I must draw to your attention concerns the decision by Nick Amott to 'hang up his quill' as the editor of our magazine, In Brief. Nick has performed this role since 2003, quietly ensuring that editions of In Brief appear twice a year, packed with association news on past and future GPAE events. The next edition of In Brief is due for publication in March 2012, so we are actively and urgently seeking a volunteer from amongst the membership to replace Nick and continue this important role that showcases our organisation. There are proposals about which you will hear later at this AGM to revamp In Brief and change the way in which it is produced and printed. These will be exciting times for a new editor. For anyone who might be interested in assuming this important position, a Job Description has been prepared to more fully explain the editor's role and define responsibilities. Please contact any committee member to express your interest.

My second disappointment has been a recurring theme in recent Chairman's annual reports - that is the lack of involvement and engagement of young engineers in our organisation.

Once again, the Aungier Award, the best paper award specifically targeted for young professionals has not been made in 2011. It is the 4th year in succession that we have not been able to make this award. In an effort to address this concern and engage younger engineers in the organisation, the Management Committee voted this year to offer a discount price for young engineers to attend the conferences. The success of this initiative will be monitored for its effect on attendance.

Separately, and perhaps more excitingly, Soufyane Teffahi of BP has volunteered to be the young professionals' champion. Many of you may remember that Soufyane won the last Aungier award in 2007 for his paper 'Managing Uncertainties in Reservoir Fluids in the design of Gas Processing Facilities' and he has offered his services to try to enthuse the next generation of young engineers to join our association and assure its future. Soufyane will say a few words later in the AGM and I would urge all of you whose companies support young professional organisations to provide him with their contact details so that he can start to build a network.

Despite the difficult financial situation, GPAE membership numbers have continued to increase and we now have 139 corporate and 321 individual members, which are respectively 18% and 35% up on last year's figures.

Ladies and gentlemen, I would like to thank you for your continuing support of the Gas Processor's Association Europe. It is your association and I, and the other members of our committees feel privileged to be able to represent your interests in the operation of the GPA Europe.



Presentation of plaque for services to GPA to retired Executive Administrator, Don Cooney

FLARESIM™

Taking the heat out of Flare Design

The industry standard application for analysing radiation, noise, surface temperature and gas dispersion from multiple flares with optional shielding.



Relieving the pressure of PSU Design

PSVPlus design to API standards integrated with a comprehensive project database and links to industry standard software.



For simulation, steady state or dynamic, choose Softbits – the company with flair

Tel: 01420 561511 www.softbits.co.uk



In brief, we go to the ends of the earth to meet our clients' gas conditioning needs.

Some of the world's largest gas producers rely on Huntsman's **DGA®** Agent and **JEFFTREAT®** solvents and additives to remove undesirable compounds from refinery and natural gas streams – making their products safe for domestic or industrial use.

Contact a member of our dedicated Gas Treating Team at: +1 281 719 6000 or Gas_Treating@Huntsman.com



The Board/Management Committee will still oversee the daily operation of the association, and the financial position will still be subject to annual review by the members in the form of an annual report.

What differs is that the members are no longer liable for the impact of any contractual problems that may occur. But what could go wrong – we have never had such a problem in the past? That is correct, but is mainly due to careful planning and good luck. What we cannot legislate for or contractually protect ourselves against would be a major disaster, such as an accident occurring to our guests, for example on the Companions' Tour at the Annual Conference. In the event of such an accident it is no longer enough to say that our guests should have insured themselves. We could expect that an injured guest's lawyers might decide that, since GPA Europe organised the event, they should be liable for damages and costs. As we are structured today, that means that the lawyers would be able to sue our corporate members, individually and severally – a liability of which, we are sure, they are unaware.

Advantage

As an incorporated organisation, the worst that could happen is that the funds of GPA Europe Ltd which are relatively small, would be quickly exhausted in the event of any dispute, the company would go bankrupt and the

maximum liability of each member would be £1. Most lawyers would probably not bother to expend time and effort prosecuting under such circumstances.

The more prosaic advantage of incorporating is that the resultant company will be a corporate body and fully able to sign contracts within which its liability can be carefully defined. This opens up the way for the development of future growth opportunities for the GPA Europe Ltd including the establishment of co-operative ventures such as that with dmg::events for the establishment of a major European Gas Processing Conference and Exhibition to stand alongside GPA Europe's traditional conference programme. More details on this opportunity are provided elsewhere in the edition.

Committed

GPA Europe Ltd is of course committed to ensuring that possible bankruptcy of the organisation will never arise and will continue to manage its affairs with fiscal responsibility and the highest regard for Health and Safety. The Board / Management Committee is equally committed to ensure that any and all contracts entered into by the organisation are carefully constructed to minimise any and all risks, but we would be failing in our responsibility if we did not consider the implications on our members of even the most unlikely risks and their effect.

Thus, the Management Committee put before the Annual General Meeting in November 2011 the proposal that GPA Europe Ltd. should be formed. There was heated discussion on the subject, but in the end the motion put to the AGM to incorporate was supported by a substantial majority with the Management Committee asked to consider the questions that were raised, in finalising the structure of the new company.

The Management Committee discussed at length the issues raised at the Annual General Meeting, at their first meeting in January 2012 and decided on certain modifications to the Articles as originally proposed. The main recommendation was that the Board of the Limited Company should comprise of a minimum of six, with no upper limit, of directors drawn from those members of the current Management Committee willing and able to serve, thus providing even greater member representation on the Board. The Management Committee as currently constituted would continue to act as it has always done and include the Board plus those other current Management Committee members.

The Board and the Management Committee of the GPA Europe are convinced that the action taken is the right course to secure the continued existence, and allow the managed growth of the GPA Europe with minimum risk to its members.

EUROPEAN GAS PROCESSING SHOW

WEDNESDAY 15 - THURSDAY 16 MAY 2013

GPA Europe has signed an Agreement with dmg events to jointly develop a new event for the European Gas Industry. Known as the European Gas Processing Show, the event will be a two day Conference and Exhibition, to be held in the Dusseldorf Messe on the 15th and 16th May 2013.

The show will bring together leaders and professionals in the European Gas industries looking for suppliers, partners, knowledge-sharing and innovation. Over 7000 m² of exhibition space and outstanding conference facilities will be available.

Day 1 of the Conference will focus on the Commercial and Regulatory imperatives for the supply distribution and regulation of the European Gas Industry. Day 2 will address the development of innovative technologies to meet the requirements and challenges faced by the European Gas Industry.

The European Gas Processing Show will be the Industry forum and meeting place for technical professionals within the European Gas Industry, providing an excellent opportunity to meet with leading operators, suppliers, utilities and service companies.

GPA Europe members will be able to attend one or both days of the conference at attractive rates which will include a reception, gala dinner and two nights' accommodation. Similar packages to

those usually offered for our Conferences will be developed. Exhibition entry will be free and GPAE member Companies will be able to book exhibition space at a discounted rate.

GPAE has undertaken to develop the conference programme for Day 2 and we will launch the Call for Papers at our Annual Conference in Berlin. This will be an ideal venue for our members to present papers on innovative topics, introduce their companies to a wider audience, and participate in the networking and learning opportunities presented by the Exhibition.

Further information can be obtained from the GPA Europe Administration Office. Details of the website for the show will be made available to members in April this year.

EVENTS

May 23 - 25, 2012

Berlin, Germany

2012 ANNUAL CONFERENCE - HOTEL PALACE

- One and half day of Technical Paper
- Special Half-Day Young Professionals Training on Sour Gas Treatment
- Conference Dinner
- Companions Tour

October 8 - 11, 2012

Excel Centre, London

GASTECH

- GPA Europe Exhibit
- Full day's presentation at Centre of Technical Excellence on 9 October
- GPA Europe Attendee's Dinner
- Accommodation Packages available
- Gastech Conference - Special Discount available to GPA Europe members.

Call for Papers Open - Closing Date
13 April 2012

November

London

ANNUAL GENERAL MEETING AND TECHNICAL MEETING

Call for Papers Open -
Closing Date 30 September 2012

Technical Meeting:

'Monetisation of Marginal Fields'

March 13-15, 2013

Paris

TECHNICAL CONFERENCE

Subsea Development and Raw Gas
Transportation

- Full day of Technical Papers
 - Special Half-Day Young Professionals Training
 - Conference Dinner
- Paper offers welcome

May 15 - 16, 2013

Dusseldorf Messe, Germany

EUROPEAN GAS PROCESSING CONFERENCE AND EXHIBITION

- In Collaboration with dmg:events, GPA Europe will provide one day of technical papers as part of the Conference
 - Special attendance rates for GPA Europe members
 - Conference Dinner
- Paper Offers welcome

September, 2013

Edinburgh

30TH ANNIVERSARY ANNUAL CONFERENCE

One and half day of Technical Paper

- Special Half-Day Young Professionals Training On Sour Gas Treatment
 - Conference Dinner
 - Companion's Tour
- Paper Offers welcome

CORPORATE MEMBERS

This listing of current Corporate Members represents the status as at the end of 2011. In addition there were 280 active individual members

Corporate Level 1 Premier

Aker Solutions	France
Amines & Plasticizers Ltd	India
Atlas Copco Energas GmbH	Germany
BASF SE	Germany
Bechtel Ltd	UK
BG Group	UK
BP	UK
Compressor Controls Corporation	UK
Costain Energy & Process	UK
DOW Oil & Gas Europe	Switzerland
EON-Ruhrgas AG	Germany
ExxonMobil Norway	Norway
Fluor Ltd	UK
Foster Wheeler Energy Ltd	UK
Gas Technology Centre NTNU-SINTEF	Norway
Gassco AS	Norway
GDF Suez	France
GE Oil and Gas ESP Ltd	USA
GL Noble Denton	UK
Jacobs Engineering	UK
Kellogg Brown & Root	UK
Lurgi GmbH	Germany
M-I Swaco Production Technologies	UK
National Grid	UK
Offshore Design Engineering Ltd	UK
OMV E&P GmbH	Austria
Pall Corporation	UK
PBG SA	Poland
PECOFacet	UK
Perenco UK	UK
Petrofac Engineering Ltd	UK
Shell Global Solutions Int BV	Netherlands
Siemens Industrial Turbomachinery	UK
Sime	Italy
Saipem SpA	Italy
South Hook LNG	UK
Statoil A.S.A.	Norway
Technip France	France
Total	France
WorleyParsons	UK

Corporate Level 1

ABB Engineering Services	UK
Air Products Plc	UK
Alfa Laval	Sweden
AMEC Group Ltd	UK
Cameron Systems Ltd	UK
CB&I Ltd	UK
CB&I Nederland B.V	Netherlands
CECA SA	France
Chevron	UK
ENI Div E&P	Italy
Evonik Industries	Germany
Grace GmbH & Co KG	Germany
Huntsman Corp	Belgium
Johnson Matthey	UK
Koch-Glitsch	UK
MOL Hungarian Oil and Gas Co	Hungary
NORIT Nederland BV	Netherlands
Shaw Stone and Webster	UK
Siirtec-Nigi SpA	Italy
Sulzer Chemtech Ltd	Switzerland
Taminco	Belgium
Techint SpA	Italy
Technimont KT	Italy
TNO Energy	Netherlands
Vopak LNG Projects	Netherlands
Wintershall Holding AG	Germany

Corporate Level 2

BASF Catalysts Germany	Germany
Bryan Research And Engineering	USA
Chart Energy and Chemicals Inc.	UK
Criterion Catalysts and Technologies	USA

Danfoss A/S Oil and Gas	Denmark
E.I.C. Cryodynamics Division	UK
Enerflex (UK) Ltd	UK
Energy and Power Consultants	UK
Escher Process Modules	Netherlands
Exterran (UK) Ltd	UK
Fives Cryo	France
FLEX LNG Management Ltd	UK
Frames Process Systems BV	Netherlands
G.I. Dynamics	Netherlands
g3	UK
GDF Suez E&P Deutschland GmbH	Germany
Granherne	UK
Hamworthy Gas Systems AS	Norway
Heatric	UK
IMA Ltd	UK
Inprocess Technology & Consulting	Spain
ISG	Italy
Iv-Oil and Gas	Netherlands
John M. Campbell & Co	USA
Johnson Controls (Process Division)	UK
Kanfa Aragon AS	Norway
Maxoil Business Solutions	UK
Mott MacDonald	UK
MSE (Consultants) Ltd	UK
Oil & Gas Systems Ltd	UK
Optimus Services Ltd	UK
P S Analytical	UK
Peerless Europe Ltd	UK
Penspen Ltd	UK
PGNIG SA	Poland
Pietro Fiorentini	Italy
Procede Group BV	Netherlands
Process Systems Enterprise Ltd.	UK
Prosernat	France
Purvin and Gertz Inc.	UK
px (TGPP) Limited	UK
Refrigeration Engineering Pty	Australia
Rotor-Tech, Inc	USA
SBM Offshore Gusto	Netherlands
Siemens Nederland NV	Netherlands
SPT Group Ltd	UK
TGE Gas Engineering GmbH	UK
Tracero Ltd	UK
Tranter	UK
Twister BV	Netherlands
UOP NV	Belgium
Virtual Materials Group	Canada
VTU Engineering GmbH	Austria
Weir LGE Process	UK
WinSim Inc	USA
Zeochem AG	Switzerland
Zeta-pdm Ltd	UK

Corporate Level 3

Gamma Business Solutions Ltd	UK
Infochem Computer Services Ltd	UK
Kirk Process Solutions Ltd	UK
Matrix Chemicals BV	Netherlands
McMurtrie Ltd	UK
MPR Services	Netherlands
O&GBISS BVBA	Belgium
OAG Energy Consulting Ltd	UK
Optimized Gas Treating	USA
Rowan House Ltd	UK
Softbits Consultants Ltd	UK

Academic Level

University of Surrey	UK
----------------------	----