

Dear business partners, Dear friends,

Obituary

On April 21st our former EDL Chief Executive Officer

Gerhard Moser

died completely unexpectedly. In May he would have turned 64.

Mr. Moser was EDL's Chief Executive Officer from 12/01/ 2001 until 06/30/2008. It In his private life it was quite natural for Gerhard Moser to show a high social commitment since he worked in a voluntary capacity as president of the Gymnastics Club in Dettingen and as chairman of the Society for the Promotion of the Children's Home in Aschaffenburg. The engineering offices of Pörner Group were able to withstand the global recession of the last business year successfully.

Large-size projects were in progress so that a history record group turnover of more than EUR 54 million (of that more than EUR 30 million for pure engineering services) could be generated.

We have succeeded in securing most of the few remaining projects on our home markets for our company group. These projects mainly focus on environmental issues, replacement investments and plant optimizations for our regular customers. This is obviously thanks to the good lineup of the Pörner companies that are reliable, customer-oriented and not least worth the money engineering partners with medium-sized structure. Pörner has become a quality connotation because of this decisive extra of innovation and motivation shown by our experienced employees every day. The upside of the crisis was that we could take on additional, good engineers. After Jacobs Austria was closed down a group of engineers was e. g. recruited by Pörner Vienna. Thus, we are all well geared up for the forthcoming upswing.

Worldwide successful with own technologies

Since national economies invest in infrastructures (especially in roads) in an anti-cyclic manner at present, the worldwide bitumen consumption increases, so that Pörner Vienna's Biturox[®] process sees a high demand right now. In addition to the Biturox[®] project in Pakistan a large-size turn-key contract could be undersigned with SAMIR in Morocco most recently. Furthermore, license agreements were signed with customers in India and Iraq. EDL Leipzig and Pörner Grimma have also established their business in technological niches in recent years allowing them to market small to medium-sized chemical plants and decentralized energy supply facilities globally. The new turn-key order for a formalin plant to be set up for LANXESS confirms the technology-oriented marketing policy. National project financing tools (ÖKB, Euler-Hermes) are particularly valuable in terms of plant exports and, therefore, they are increasingly deployed.

Bright prospects

This year faces a change of the economic trend. Recent estimates proceed from a global growth of 4.2 % and draw an optimistic picture.

And there are signs of new orders for Pörner Group. Particularly smaller chemical plants to produce specialties are more and more coming in: that is the right size to be handled by companies of Pörner Group.

We therefore look ahead confidently: we will build up new, productive and profitable plants together with our customers and hence create lasting values for man. We thank our customers and partners for their long-lasting trust in our engineering companies' capability especially in the last business year. We continue to provide you with firstclass services at reasonable prices – with this decisive extra of commitment, flexibility and reliability what is Pörner known for.

was his great merit to have led EDL out of the RWE Group into Pörner Group with strength and courage. In the first years of difficult restructuring he headed the company in a strong manner – as a manager of integrity he was just the right man to manage the process of regeneration.

Over the many years of joint efforts he gave - based on his experience and foresight, strength and fairness - crucial impulses to our Group and due to his personality he managed to position EDL as recognized and high-performance engineering company well-known for its reliability and professional competence.

We, but also our customers could always count on his word.



We commemorate an excellent man who lived his life sincerely and honestly. We will always cherish his memory with great thankfulness.

The management board of EDL Anlagenbau Gesellschaft mbH The shareholder and the management board of Pörner Ingenieurgesellschaft mbH



Your Andreas Pörner and Peter Schlossnikel

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Projects



Shell by Pörner + Partner



Vienna chael Mazzucato).Since the first Shell Austria filling station was

built by Pörner in Mauthausen in 1992, Shell Austria has been among the regular customers.

The largest filling station project for Shell Austria guided by Pörner + Partner recently was the construction of the first unmanned truck filling station in Loosdorf/Lower Austria.

Apart from the usual time



in this project was supervision and data transfer.

Initial filling and commissioning took place in due time in mid February 2010. The official opening ceremony with representatives from politics, economy and numerous Shell employees from Germany, Austria and Switzerland was held on March 5th, 2010.

The team headed by Michael Mazzucato comprises eng. Claudia Deutschmann-Zahor, eng. Thomas Fojtl and eng. Clemens Leimer and is in charge of more than 100 filling stations in Austria. Apart from construction of new filling stations and larger revamps this field of work also



includes technical and optical refurbishments, Austria-wide roll-outs (design modifications, introduction of new fuel qualities, installation of automatic tank capacity measurements etc.), soil decontaminations, complete closing-down as well as takeover resp. handover of filling stations to other groups of companies. The specialized Pörner + Partner team provides the complete service portfolio beginning with layout including property valuation, obtaining authority approval, tendering and price negotiations on behalf of the customer, local construction supervision including engineering and site coordination according to BauKG (Federal Construction Works Coordination Law applicable in Austria) up to handover.

(Mi-Krefeld (Gerhard Bacher). + + + Pörner Ingenieurgesellschaft mbH Grimma received turn-key contract for setting up a formalin plant in close cooperation with licensor Dynea ASA for LANXESS in Krefeld-Uerdingen + + +

> On March 18th, 2010 Gerhard Bacher, General Manager of Pörner Grimma, and Lars R. Axelsen, Group Vice President Process Technology of Dynea ASA signed a contract for turn-key construction of a 150,000 mtpy formaldehyde plant (32% concentration) with infrastructure for LANXESS Germany in Krefeld-Uerdingen/ Germany.

The total investment value of the new plant including process optimization amounts to approx. EUR 18 million. Construction of the new plant is expected to start in the third quarter of



Vienna (Gebhard

NEW TURN-KEY CONTRACT FOR PÖRNER LANXESS Pörner Grimma builds new formalin plant for LANXESS

this year, with commissioning earmarked for the end of 2011. In addition to the production plant, new formalin and methanol tanks will also be installed on an area of about 1,000 m².

eleven projects have already been implemented together. With the construction of the latest formalin plant based on the Dynea Silver[®] process permanently being imfrastructure measures such as the installation of a methanol and formalin tank as well as methanol unloading facilities and an extensive piping system for connecting the plant with the existing infrastructure.

LANXESS – a strong partner

With the new formalin plant the specialty chemicals group LANXESS will no longer be dependent on purchasing this feedstock required to produce trimethylolpropane (TMP). TMP is e. g. used for numerous products in the furniture, construction and automotive industries.

"We will have significant cost advantages because of

zero transportation costs and synergy effects as to energy efficiency", explains Werner Breuers, board member of LANXESS AG.

LANXESS is a leading specialty chemicals group that has

about 14,600 employees in 23 countries currently. The company maintains 43 manufacturing bases all over the world. LANXESS' core business covers development, production and sales of plastics, rubber, intermediate products and special chemicals.

<u>PÖRNER GRANTS 7th License to India</u> More than 50% of bitumen production from Biturox[®] plants



Contract signing in Grimma, (f.l.t.r.): G. Bacher (MD Pörner Grimma), L. Axelsen (Group Vice President, Dynea), Dr. M. Friederich (Engineering Manager BAC-T TMP-Plant, LANXESS), R. Schraysshuen (Administration & Sourcing - Head of Procurement, LANXESS)

> proved and optimized this partnership is successfully being continued.

Besides the turn-key supply and erection of the formalin process plant with downstream thermal off-gas treatment with heat recovery Pörner Grimma's scope of work also includes in-

Kracher). in India. Pörner has enjoyed a The basic engineering will be engineered and the key equipment delivered by Pörner Vienna. Commissioning took place in October 2009 under supervision of Pörner process engineers. The plant was handed **IOCL Mathura commissioned** over to the customer at the end of the year.



Pörner Grimma is the Pör-

Group's technology center for formalin and its derivates (formalin, UFC, paraformaldehyde, hexamine UF, MUF, MF, PF

Pörner Grimma: Technology

resins, novolacs and bace-

lites, acetaldehyde, penta-

erythritol, polyester and

In a more than 20 years'

cooperation with Dynea

alkyd resins).

ner

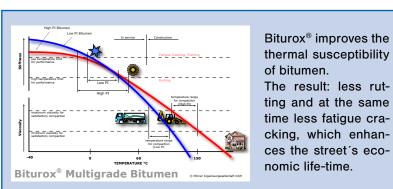
center for formalin/derivates

In recent years this Shell team was more and more entrusted with maintenance tasks.

Pörner has been active on the Indian market for many years. Already the 7th Biturox[®] plant in India furnishes proof of the good business relations with the Asian country.

New order from ESSAR

Pörner Vienna has received a new order for a Biturox[®] plant this March. The customer is ESSAR OIL Ltd. – one of the leading oil & gas companies



long and successful partnership with the globally acting group with over 20 subsidiaries and a workforce of approx. 60.000 employees.

The new bitumen plant will be built at Vadinara refinery on the west coast of India. As well as the license, the scope of services includes the basic engineering, pilot tests with various raw materials, commissioning and start-up.

completed after 5 months only, so that the finished plant can be handed over to the customer in exactly one year.

In the previous Indian project Pörner was awarded a contract for a revamp of two reactors in the Mathura refinery.

For the customer, the Indian Oil Corporation Ltd. (IOCL), it is already the

second Biturox[®] plant after a project implemented in the Gujarat Refinery, Vadodara in 1998. The revamp of two old reactors of Russian design was

With that more than 50% of bitumen made in India is produced in plants licensed by Pörner.







<u>TURN-KEY CONTRACT FOR</u> PÖRNER VIENNA Pörner puts up Biturox[®] plant in Morocco as general contractor



Vienna (Wolfgang Heger). On October 30th, 2009 a contract for engineering and construction of a new Biturox[®] plant



J.M. Ba-Amer (General Manager Samir) and W. Heger (Sales Director Pörner)

including tank farm and truck loading facilities was signed between the Moroccan Refinery SAMIR and Pörner.

Meanwhile this has been the 38th(!) Biturox[®] license granted by Pörner.

Pörner as general contractor will build this lump sum turnkey plant in Mohammedia/ Morocco. Pörner's scope of work includes all supplies and services required to set up the plant: beginning with financing support and granting the license Pörner is also responsible for basic and detail engineering including civil/structural, electrical, instrumentation, piping as well as procurement and supply of equipment, construction at the site and commissioning.

With a capacity of 270,000 t/a the plant will produce road bitumen, grade 40/50. Two tanks with 5,500 m³ each will be provided for storing purposes in the associated tank



Contract signing in Morocco between Samir and Pörner, (f.l.t.r.): Y. Belkhadir, H. M'Hamdi, A. Harnouch, J.M. Ba-Amer, R. Stickler, W. Heger, Ch. Opitz



view Meeting in Vienna in April 2010

farm.

After having commenced work in January 2010, the project shall already be completed and handed over to the customer in summer 2011.

The Biturox[®] plant for SAMIR with an overall investment of approx. EUR 21 mil-



lion is one of the largest bitumen projects in the history of Pörner Ingenieurgesellschaft in the bitumen sector.

POSITIVE DEVELOPMENT Pörner Romania expands



Gasoline blending plant for PETROM



Romania Member of OMV Group could suc-

cessfully complete an order for Kremsmueller Group headquartered in Wels/Austria in summer 2009. The order included engineering services, supply and construction of a gasoline blending plant in Arpechim/ Romania. The existing gasoline blending plant at Petrom's, the final customer, was extended so that up to seven different additives can be mixed in an online mixing process to get the final on-spec product. Specific requirements as to precise dosing (quantities, pressure ratios, recipe details etc.) are met by using a separate

Arpechim control system. User-friendly (Roland operation of the plant and selection of individual recipes Eichinger). Pörner were implemented by special visualization.

The main challenge of engineering and constructing this plant was to connect the new plant to the existing one.

Cooperation within the Pörner Group's network ran smoothly as usual. Both project management and engineering services including all procurement procedures were executed by our Romanian office (Ploiesti location). Our Viennese specialists were responsible for engineering, assembly and supply of switchgear cabinets as well as programming of the control system.

Dedication and reliability led to more than 100 orders in three years

> a special refinery for an international customer. Pörner Romania is

able to offer all disciplines required for complete plant engineering and construction out of one hand from the Ploiesti location. All necessary engineering services such as process, mechanical, piping, electrical and instrumentation, authority engineering, project management and procurement can be provided. Morethan 100 orders have been completed since the office was established, important regular customers such as Petrom have been acquired and a third framework contract was signed. Ambitious projects such as the detail engineering for a sour gas removal system (amine treating), implementation of a wastewater treatment plant at Petrobrazi Refinery or the detail planning of a crude oil distillation plant (atmospheric and vacuum) bear witness to the high competence of the employees.



Due to the professional cooperation of all project part-



ners the plant could be commissioned on schedule in summer 2009 after 18 months' proPloiesti (DI Michael Volkmann).

Pörner Romania is the youngest enterprise of the Group and has been working in process plant construction in Bucharest and Ploiesti since the end of 2006. The office - initially having only 5 employees - has steadily developed its capacity to cope with the increased number of orders and has a staff of 25 now. A success that is mainly based on close cooperation with the clients and the Pörner typical reliability.

Within short time confidence of the Romanian refinery customers was gained by ambitious and continuous work supporting their extensive modernization projects.

The process competence could be demonstrated when providing complete basic engineering services for construction of

The steady expansion of the

New office in Ploiesti, a 650m² villa in Victorian style is only 500 m away from the old office. Customers can find Pörner in Ploiesti in B.P. Hasdeu Street, No. 28.

Romanian subsidiary could successfully be continued even in the adverse environment of 2009, so that a three times larger office could be opened in Ploiesti in January 2010.

In addition to this – the official company name was changed to "S.C. Poerner Romania S.R.L." in February 2010. With this step the already 'lived wording' has formally been implemented.

Projects



LARGE-SCALE ORDER IN ENERGY SECTOR Construction of hard coal-fired power £nΒW plant for EnBW supported by Pörner Linz



awarded by Kremsmueller Group to perform engineering services and installation of connecting systems and piping

for a 912 MW hard coal-fired

contract

Linz (Eugen power plant to be operated by Energie Baden-Wuerttemberg Gotter). In November AG (EnBW) in Karlsruhe/Ger-2009 Pörnmany. er Linz was

The contract covers connecting systems and piping for 11 plant units, among them ammonia vaporizing unit, district heating, compressed air, fuel oil, well and heating water systems.

For the a.m. plant units complete engineering services in-

cluding process engineering and preparation of the overall technical concept, basic and detail engineering, project management, construction coordination, commissioning services as well as training and documentation provided are by Pörner Linz on behalf of

Functional schematic of the power plant



Kremsmueller Group. The engineers in Linz will be involved in this large-size project for more than 2 years, i. e. until March 2012.

Modern and ecofriendly

With a total investment of more than EUR 1 billion the new coal-fired power plant RDK 8 (Rheinhaften-Dampfkraftwerk Karlsruhe, Block 8) is being built based on the most advanced power plant technology. With an efficiency of more than 46 %, a quantum leap will be reached. Therefore, the power plant will be one of the most advanced and ecofriendly ones all over Europe with an emission rate being below statutory provisions.

The Karlsruhe site is the biggest in Baden-Wuerttemberg. The off-sites are scheduled to be commissioned in early 2011.

Important EDL projects executed under the leadership of Gerhard Moser



2001 Revamp DK4 (2nd reactor), PCK **Refinery Schwedt**





Revamp column K1001, TOTAL **Refinery Leuna**

MADB/PBS-



2008

HyLube2, Puralube GmbH Tröglitz

Beta plant, Choren Fuel



2002

Alkoxy plant, Wacker Chemie Nünchritz

Desus 1 reactor, PCK Refinery Schwedt

2003

FCC main column, PCK **Refinery Schwedt**

Contract signing with PURALUBE in

May 2007

2004

HMB BPA project, **Toyo Engineering Bitterfeld**

Revamp of coking plant, Erdölraffinerie Emsland Lingen

Resin plant, Leuna-Harze GmbH (Harze 2)

Blast furnace Linz (in cooperation with Pörner Linz)

Resin plant, Leuna-Harze GmbH (Harze 1)

2005 Cyclics Europe Schwarzheide

Synthesis plant, Fraunhofer Gesellschaft Würzburg

2006

Refinery gas plant, Bayernoil Ingolstadt

Bisphenol F (1st plant), Leuna-Harze GmbH

Revamp of HDS1, OMV Refinery Burghausen



Topping-out ceremony for the bisphenol F plant and the glycidether plant for Leuna-Harze GmbH on November 5th, 2007

2007

HF Alkylation, PCK Refinery Schwedt

Resin plant, Leuna-Harze GmbH (Harze 3)

> FCC Overcracking, PCK Refinery Schwedt

Future Concept Crystex (FCCN), **Flexsys Nienburg**

RP Compounds Schkopau

Freiberg

Glycidether 2, Leuna-Harze GmbH

IGO 50 ppm, Shell Germany **Oil Heide**



Frame contract signing with R. Kroll (General Manager, TOTAL Refinery) in January 2007

Bisphenol F (2nd plant), Leuna-Harze GmbH

HELSA HDS 1 Revamp, OMV Schwechat



Projects



Two columns revamped by EDL at PCK Schwedt Refinery





Schwedt (H.-G. Thalemann). The Leipzigbased EDL again received two orders for the 2010

refinery shutdown at PCK Schwedt. Under the working title,Crude Oil TOP 1' and,FCC GaKo' both projects had been prepared under proven direction of project manager H.-G. Thalemann in Leipzig since January resp. March 2009.

The agreed scope of work of both projects included detail engineering, construction and installation supervision, procurement and expediting.

Big columns to be replaced

Project TOP1 covered replacement of the more than 40 years old main column 1K2 in order to improve MD recovery and to produce a jet fuel component. The target of the FCC GaKo project was to create prerequisites to improve the propene recovery process. To achieve this aim it was necessary to modify stripping column 1K333 and further peripheral equipment.

Both projects focused on the installation resp. replacement of big columns under limited space conditions. A special



Assembly of column parts – everything



time both column parts were - as far as possible - pre-assembled and equipped with pipe supports, insulation and inof 50 m was required. While the old column with a weight of 235 t had to be lifted from its position, both 20 m high shells of the new column were relatively 'light' with 150 t resp. 125 t.



ternals. During the shutdown period the column parts could be installed and tackwelded on one day so that the ,shutdown installations' could be commenced one day earlier than scheduled.

For dismantling and installation of the TOP1 column a big mobile crane with a hook clearance of 72 mand a pivoting range Proportions astonish even experienced workers at site

For lifting a 1350 t crane was needed, here the second biggest mobile crawler crane in Europe with its first field work in Schwedt.

Both lifting and assembly activities being the key part of the shutdown were executed within the stipulated time and without major difficulties. Now more than 100 fitters of all disciplines are next in line to complete revamp works as scheduled.

EDL USES NEW SOFTWARE Starting signal for switching to SP3D

Leipzig (Roman Tatsch). EDL has begun to switch to the new 3D plant engineering software SmartPlant 3D – the 3D plant • SmartPlant Isogen completely integrated

Link between P&ID and 3D model

software producer Intergraph. Employees were trained in the last weeks. EDL now looks switch to innovative engineering tools requires a customizing phase EDL's staff will be

goes acc. to schedule

challenge was to replace column 1K2 in the TOP1 project within the shutdown period April/May 2010 (15 working days only).

Apart from clarifying such important issues as layout and pipe routing, special attention was paid to the assembly technique. Crane locations that did not damage existing underground pipelines and large electrical and instrumentation routes, techniques for dismantling old equipment the condition of which was not always known were elaborated.

Second biggest crawler crane in Europe to be deployed

The new column 1K2 was delivered in two parts and placed on two separate, especially prepared foundations.

In order to save installation

engineering system of the

next generation by Intergraph. This new software will replace the very successful, but ageing planning software PDS at EDL.

What's new?

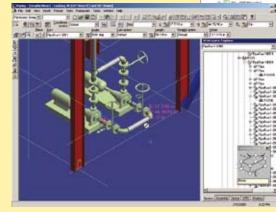
The quality leap from designoriented to object-oriented engineering is the actual innovative step.

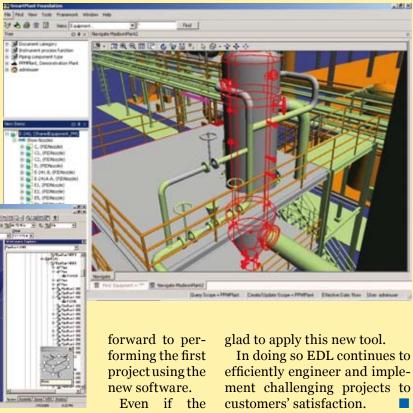
- New are:
- Integration and consistency of all disciplines (piping, EQP, structural, electrical, HVAC)
- Grids & coordinate systems
- Space Management (zone definition)
- Interactive collission check
- Intelligent drawings & reports
- Relations & data integration of 2D & 3D through all disciplines

1110 401

- System and specification management with Windows access rights
- Global worksharing (database replications support simultaneous engineering; data comparison via Citrix server or online)

The most important advance compared to PDS is simplified use and essential time savings as highlighted by the





Series: The Perfect Project



Optimal Project Preparation

Vienna, Leipzig (Gerhard VIcek, Lutz Hoffmann, Lars Reinhold). In plant engineering investment projects where always high amounts of money have to be approved, factors such as risk analysis, financing and the question of the most efficient technology play an important role. Just in economically insecure times most accurate facts about profitability of the project are essential to make a decision against or in favour of a project.

Finally, a project is only perfect when the return on investment is optimized in terms of investment and operating costs



expected turnover. The plant does not only have to be engineered perfectly, c o m pleted on

as well as

time and successfully be commissioned, it also has to be operated efficiently as to technical and economic criteria and has to meet or even surpass the defined quantities and quality criteria.

Why is project development so important?

If project development is understood as all economic and technical planning and calculations prior to the actual start of the project, so it provides essential support to make entrepreneurial decisions on investment projects.

In this important decision-

making process Pörner Group provides its customers with comprehensive know-how as to:

- concept preparation
- technology providing / selection
- (bankable) feasibility
- studies financing support
- environmental impact assessment
- safety analysis
- expert opinions

Five questions

To put it simply – in the course of project development five questions have to be answered and fixed in writing:

WHAT - WHO - HOW -WHEN – WHERE

Simple questions, but occasionally hard to answer. The simplest and fastest answers can theoretically be given to the questions WHAT and WHO: customers usually know what they want to produce, revamp or build up, and the possible responsible promoter resp. purchaser is also known at that point of time.

To answer the questions HOW, WHEN and WHERE is more difficult. When it comes to large projects the questions can normally not be drafted simply and clearly since there are often interactions and dependencies.

Sometimes the plant location can be decisive for the technical concept of a plant: existing infrastructures (e.g. railway, ship) or local conditions (e.g. limit values for noise, emis-

sions etc.) have an essential influence on the plant concept as well as climatic conditions. In this respect cost-wise effects of WHERE and WHEN should not be neglected at all.

HOW - the most difficult question

In industrial plant engineering the designed plant capacity and the selected technology have the prime influence on costs. For this reason the question of HOW is the most important one both from the economic and technical point of view well before the GO phase of a project starts.

With its competence in process technology Pörner engineers support their customers in investigating, selecting and providing the suitable technology.

Therefore, Pörner Group has been working closely with internationally renowned licensors and technology-providers for many years in order to develop and implement plant concepts based on the selected process.

Developing new technologies, implementing special technologies and designing ,open art' technologies are in the center of combined efforts.

Know what is feasible

Technology selection is often part of a project study – also called feasibility study. However, it is rather a check of possibilities that is often a MUST in respect to financing by a bank.

A feasibility study clarifies organizational opportunities and economic feasibility (e. g. budget, financing), but also

Bankable Feasibility Study

When elaborating a feasibility study the Pörner Group offers to prepare a bankable feasibil-

ity study. This includes a detailed investment and operating cost estimate based on the basic engineering.



In order to compile such a profitability calculation efficiently and in a tamper-proof manner Pörner Group makes use of the COMFAR III program. COMFAR is a calculation program especially developed by UNIDO (part of UNO with headquarters in Vienna) to carry out profitability calculations. COMFAR allows to calculate short- and longterm financial developments of a project where input data and

technical feasibility and the availability of resources (raw materials, technology, areas, employees, technical aids etc.). It can include pilot plant tests and computer simulations as well.



assumptions made are transparent. Because of the tamperproof feature, bankable feasibil-

ity studies prepared with COM-FAR are accepted by international development banks Tamper-proof profit-(World ability calculation Bank, with COMFAR III IFC, ADB, IDB...). An im-

portant step towards financing, where Pörner Group can be of assistance.



With a project study the risk of achieving the objective shall be checked resp. defined, if it is not sure whether it is possible at all. By a feasibility study it can be found out what expenses (time- and money-wise) are required to realize a project. For this the following investigations have to be made:

- market analysis
- analysis / comparison of technologies
- analysis / comparison of locations
- analysis of competitors

GALP Bitumen Workshop

Biturox[®] process Pörner is the from. For this reason Pörner is vices was a bitumen workshop world market leader in bitumen oxidation plants. In the last 10 years alone 16 licenses were granted and bitumen plants built up mainly in Europe. Numerous tests with most diverse feeds were carried out in Pörner-owned pilot plants in the Schwechat laboratory.

Lisbon (Lydia Barth). With its our customers now can benefit GALP. Part of the scope of serfor all GALP specialists and employees involved in the bitumen issue.

In doing so Pörner has gathered specific know-how that more and more entrusted with compiling studies about the bitumen subject.

Contract award for study

In January 2010 Pörner received an order to prepare an optimization study related to the bitumen production in the two refineries in Sines and Porto, of the Portuguese oil company



Bitumen workshop at GALP

The workshop took place in the GALP headquarters in Lisbon on February 23rd/24th.

Under the headline ,How to produce quality bitumen economically' the lectures were divided into three sections: bitumen quality (bitumen chemistry and standards), process engineering ('how to make...') and profitability (commercial benefits of more, better and costeffective products).

The workshop was preceded by kick-off meetings in both refineries: thus, the technical basis for the requested optimization was well-defined. As a result, the workshop became a very lively discussion among

Michal Blazej and Andreas Pörner

approx. 20 participants and Pörner experts: the talks did not confine to theory, but were immediately compared with own experiences gained by GALP's laboratory, production and marketing experts.

A possible changeover to lighter crude oils and targeted quality improvement (e. g. PEN index) were explained and discussed in detail in order to meet new standards and open up new markets.

The discussion with all participants scheduled for the second afternoon lasted until late night: a visual proof of the GALP team's commitment and reassurement for Pörner that the workshop was of great value to our Portuguese customer.

- (where necessary)
- risk analysis (technology, time, expenses, legal framework conditions, subsoil etc.)
- profitability calculations (e.g. return on investment)

Stop or Go

If the result of the study is negative or inefficient or too risky under given preconditions, the project has to be rejected or completely changed. After compiling a feasibility study a decision on stop or go has to be made in any case.

To sum up, project development plays a decisive role in a perfect project. With wellfounded and as comprehensive as possible analysis of most diverse influencing factors a plant engineering project can successfully be implemented in most cases.