

WELCOME ABOARD

We are pleased to announce the appointment of Mr. Prakash Menon as the new Vice President of Sales for Southeast Asia (Asia Pacific). He is located in our Singapore office, and reports directly to Larry Ambrose , President Worldwide Sales.

Before joining Ruhrpumpen, Menon (as he prefers to be called) spent 23 years with KSB Pumps Limited, first in India and later in Singapore. In his time at KSB, he held many different assignments, from field service work to his last position, which he had held for the past eight years, as Manager of their Competency Center. His invaluable experience in the Asia Pacific pump market will complement Ruhrpumpen’s plans for significant growth and market presence in this region. Menon holds a Bachelor’s degree in Mechanical Engineering and a Master’s in Management Science.



Mr. Prakash Menon, Vice President of Sales for Southeast Asia

WELCOME ABOARD NEW SALES TEAM



Sammy Monistere, Aftermarket Sales Engineer
Baton Rouge, Louisiana



Joe Jirgal, Regional Sales Manager
Cleveland, Ohio



Matt Benson, Aftermarket Sales Engineer
Tulsa, Oklahoma



Gun woo Ryu, Sales Engineer
Gyeonggi-Do, Korea

■ Ruhrpumpen Article in Bolivian Press

“Ruhrpumpen Manufacturer of Pumps for the Combined Cycle of Guaracachi”



Test lab in Ruhrpumpen plant, Monterrey Mexico.



Juan Berisso and Ricardo Vazquez from Ruhrpumpen, Antonio Lanza from EGSA and Percy MacLean from PEMAC.



Pump shell in the manufacturing plant in Monterrey.

Ruhrpumpen, the specialist for centrifugal horizontal and vertical pumps, took charge of the fabrication of a cooling system to be used in the implementation of the Combined Cycle Plant of Guaracachi S.A. (EGSA) located in Santa Cruz de Las Sierras. Fabrication and testing of the pump took place at the Monterrey, Mexico plant, the pump will be sent to Santa Cruz for installation.

Ruhrpumpen's Bolivia representative PEMAC, managed to beat out the competition and win the bid to supply pumps for the Power Generation company Guaracachi last year. Ruhrpumpen provided a series of operative pumps for the “Simple Cycle to Combined Cycle” project. This project was designed to optimize the energy and avoid any contamination to the environment. This is accomplished by the recovery and recycling of gases and energy that are expelled by the turbines.

This is a very important project for the energy market that will result in 82 megawatts of electricity, with an investment of approximately \$40 million which was granted through Corporacion Andina de Fomento CAF.

With more than 50 years in the pump industry, Ruhrpumpen is known worldwide for its quality and wide selection of products for use in a variety of applications, such as oil & gas, power, chemical, water, and heavy industry and Chemical Markets. Ruhrpumpen's pumps are unique and engineered specifically for each application.

Percy MacLean, Manager of PEMAC, pointed out that Ruhrpumpen has plants in Germany, the USA, and Mexico, which helps to support our customers with both products and services worldwide. Mr. MacLean also explains that the most common machine in any industry is the electric motor, followed closely by the pump.

The Project and Development Manager of Guaracachi – Mr. Mr. MacLean and Mr. Antonio Lanza, Guaracachi Director of Projects and Development of PEMAC visited the Ruhrpumpen facility in Mexico to conduct final tests on the three pumps acquired by Guaracachi. During this visit Mr. MacLean commented

“These pumps are an important part in the process of the Combined Cycle, and PEMAC is pleased to be a part of that process in partnership with Ruhrpumpen.”

Official Representatives

In Bolivia, PEMAC represents companies such as Ruhrpumpen, XL Systems, a tube fabricator for the perforation of oil wells, Tube Alloy, specializing in tubular accessories that are also used in the perforation of oil wells, and Wright Tool, an American fabricator of manual tools for professional use.

For the past 18 months, PEMAC has been working specifically with Ruhrpumpen to establish our products in their country, which has proven to be a positive step. In the expansion process, Ruhrpumpen acquired a series of existing manufacturers in Bolivia, such as Worthington and Bryon Jackson.

■ Ruhrpumpen Launches their Renewed SCE, Heavy Duty, Single Stage Centrifugal Process Pump for API 610

Ruhrpumpen announced the launch of the renewed SCE pump for the petrochemical industry

The renewed and improved SCE pump meets API 610 standards and is ideally suited for all refinery and petrochemical plants, oil fields and pipelines as well as offshore, marine and dock services.

Casing of the Renewed SCE

The renewed model has available 75 volute casing pump sizes for 50Hz and 60Hz power supply, and centerline discharge nozzles from 1" to 12". This results in 118 hydraulic combinations to meet all customer needs. For low NPSH applications, the installation of an optional inducer is available. The mechanical seal chamber dimensions are in full compliance with API 610 and API 682. For easy of maintenance, the casing is centerline supported and features a back-pull-out design. The casing as well as the fully-welded, fabricated steel baseplates with drip-plate are designed to be fully compliant with API 610 nozzle forces and moments.

The casing and casing cover are in metal-to-metal contact. The non-asbestos spirally-wound gasket is made of stainless steel/graphite foils and is totally enclosed; this assures sealing without misalignment.

Low Vibration Results with the New Shaft

Shaft deflection of less than 0.03mm (1.2 mils) in the stuffing box area is achieved with a larger-diameter and minimum-length shaft. Additionally, the correct sizing of the bearings, and the use of double volutes results in low vibration values.

Bearing Bracket Improvements

Antifriction bearings are designed with an operating life of more than 25,000 h. To ensure long-life in the bearings and to improve heat dissipation, the bearing bracket has fins and fan cooling as standard. Water cooling with a finned-tube insert is optional. The bearing bracket is designed with an internal conical surface to prevent oil flow to the mechanical seal during disassembly for maintenance.

For visual inspection and sampling of oil, the bearing bracket is provided with a sight glass and a constant level oiler. For heavy duty conditions, the increased bearing bracket stiffness guarantees low vibration levels, ensuring safety and reliability. Per API 610, there are locations in the bearing bracket and casing cover specifically designed to monitor vibration and oil and bearing temperatures. To optimize bearing lubrication, the bearing bracket is designed with an oil ring system and a cast oil channel.

Further Improvements

Renewable front and back impeller wear rings, casing and casing cover wear rings, and throat bushing are standard. All auxiliary piping is flanged to the casing with special connectors of a rugged registered design. An integrated orifice is also possible. Oil mist lubrication is optional (pure and purge) as the labyrinth seals are designed to work with either oil or oil mist lubrication.

As of today, this renewed SCE is available for all Ruhrpumpen customers.

For inquiries, you can send an e-mail to info@ruhrpumpen.com or for more information on Ruhrpumpen products you can visit www.ruhrpumpen.com



■ **Michael Hirschberger explains the review of NSS limitations and new opportunities at the 25th International Pump User Symposium in Houston**

Specifications of some pump users limit the suction specific speed (NSS) with the objective of selecting more reliable centrifugal pumps. This limitation is based on a statistical evaluation of pump failures published by Hallam (1982) that seemed to show a relationship between the value of Nss and the probability of failure. It was stated that intensive suction recirculation had caused the failure of the pumps due to the high suction specific speed, but the root causes of these failures were not examined in enough detail at that time. Ruhrpumpen prepared the review of the NSS limitations and presented this to the audience at the Houston Pump Symposium, explaining why limiting NSS speeds is not the solution. If you would like to read more about this please go to www.ruhrpumpen.com/literature



Michael Hirschberger at the 25th International Pump Users Symposium. February 23-26, 2009

■ **Ruhrpumpen Office in Singapore**

In line with the growth plan of the group, Ruhrpumpen has registered a 100% owned office, Ruhrpumpen Singapore (SEA) Pte Ltd. This office aims to provide quick response in preparation of quotations and technical inquiries for customers in the region.

The team at Ruhrpumpen Singapore SEA is led by Mr. Prakash Menon (VP – SEA). Mr. Menon took charge of this office in May 2009. Staff includes Mr. Francis Chua (Sales Manager), Mr. Tay Peir Chyang (Application Engineer). Mr. Ravi Sankar (Sr. Application Engineer) and Mr. Gun-woo Ryu (Sales Manager, Korea) Mr. Sankar and Mr. Ryu are recent additions to the group. With the registration of this new office, Ruhrpumpen Singapore now aims to package the pumpsets locally customers within the region.

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s i n g a p o r e g o d o w n b u i l d i n g

■ Ruhrpumpen Decoking Tool Well-received by PEMEX

In June 2008, Mr. Dionisio Gonzales Rojo, PEMEX Manager of the Hector R. Lara Sosa Refinery, located in Caderyta, Nuevo Leon, Mexico accepted a trial installation of our auto-switch cutting tool for the Decoking Unit of the refinery. PEMEX Decoking Unit personnel provided detailed operating information (Jet Pump hydraulics, Coke Drum diameter & height and process parameters), and Ruhrpumpen then provided, detailed site-specific auto-switch cutting tool drawings. These drawings were then sent to Francisco Vilante, Manager of the Mechanical Maintenance Department. We then received authorization to proceed from Leobardo Rocha, Coordinator of the Mechanical Maintenance Department. The auto-switch cutting tool was manufactured at Ruhrpumpen GmbH in Witten, Germany and was delivered to the refinery in February 2009.

In March, 2009, PEMEX Decoking Unit personnel received Installation and Operating training from Ramon Martinez and Jay Jones, which highlighted switching procedures and maintenance procedures for removal of the auto-switch cartridge.

The cutting tool was installed on the drill stem for Coke Drum number one (of four) Coke Drums. The cutting process took less than 60 minutes without any problems. After 7 months of operation, the Manager of Operations, Abner Sta. Maria made the following observations:

- The average cutting time for the Ruhrpumpen auto-switch cutting tool is 50 minutes, while the average cutting time for the competition is 80 minutes.
- The Ruhrpumpen tool has operated seven months without incident, while the competition's longest operational period of operation has been three months.
- In the event of a collapse of the coke in the drum, the cutting tool can become stuck. Due to Ruhrpumpen's streamlined design, the tool can be dislodged typically in under 30 minutes.

Based on this evaluation PEMEX now wants to change all of the Cutting Tools installed to the Ruhrpumpen design.



■ Large Ruhrpumpen Project for Origin Energy in Australia

PROJECT DETAILS

Customer: Origin Energy
 Engineering Contractor: Technip
 Project: Kupe Gas Project, NZ
 Project Value: \$1 billion

Pumps provided by Ruhrpumpen:

- 2 - VTP 18D450 - 350kW firepumps (1 x diesel 1 x electric)
- 2 - SVN 10x20 - 250kW Condensate loading pumps
- 2 - RPP 4x2x12.75 - 75kW Hot water pumps
- 2 - HVN 8x17 thermal oil pumps (supplied via KSB)
- 14 - various CPP21 ANSI pumps

Origin Energy is Australia's 2nd largest energy company.



■ Ruhrpumpen Sales Meetings in Latin America and North America

Our sales teams come together on a regular basis to discuss market developments and new (and ongoing) projects. Recently the Latin America Sales meeting was held in Monterrey, Mexico. The North America Sales meeting was held in Tulsa, Oklahoma. With presentations on the market developments, areas of opportunity, and projects that Ruhrpumpen is supplying in various countries, a great deal of information was exchanged



Ruhrpumpen Latin America Sales Meeting



Ruhrpumpen North America Sales Meeting

■ Ruhrpumpen AICHEMA Participation

Ruhrpumpen participated in the AICHEMA Fair in Frankfurt, Germany, this year in May. The event is held every three years, and is focuses on Chemical Engineering, Environmental Protection and Biotechnology. In five days over 173,000 visitors from all over the world visited the exhibition in order to catch up on the latest products and technologies. Ruhrpumpen had a very successful participation and was able to show pumps for their core markets, which are oil & gas, power, chemical, water, and heavy industry.



■ Ruhrpumpen Egypt Participation in Intergas Fair

The 5th International Conference & Exhibition for Oil and Gas (INTERGAS V) was held at the Cairo International Convention and Exhibition Center May 12-14

Building on the outstanding success of our first participation in 2008, Ruhrpumpen Egypt returned to the INTERGAS Conference & Exhibition again this year.

Under the patronage of Egyptian Minister of Petroleum H.E. Eng. Sameh Fahmy, INTERGAS V has become the most important energy event ever held in Egypt.

The conference presented 80 speeches in 27 sessions and attracted more than 1,000 delegates in 4 days. The conference, which is organized alongside the exhibition, highlighted the strategic business opportunities offered by oil

and gas leaders in Egypt and the MENA region, and best practices in industrial and service fields developed by suppliers. The 5th edition of the exhibition presented the most successful show in INTERGAS history. More than 430 worldwide exhibitors displayed their products, services and projects for more than 4,000 visitors including delegates, business professionals, and technical professionals.

The Ruhrpumpen Egypt booth was visited by 150 guests from 50 different companies (20 of them were new companies for us).

A new brochure for the Ruhrpumpen Egypt facility in Suez was distributed at the conference.

The conference was very successful and allowed us to strengthen existing client relationships and develop new relationships as well.



■ GPS TAUGHT IN UNIVERSITY

Doug Kriebel, P.E. is one of the principal owners of Kriebel Engineering, Ruhrpumpen's representative in the Philadelphia region.

Doug was asked by a professor from a large local university to teach a few sessions on pump design as part of an advanced course on Chemical Equipment Design. Doug used the Ruhrpumpen GPS website to allow the senior Chemical engineering students to select pumps based on low case hydraulic conditions which they had to calculate for a particular design project. Part of the course included how to evaluate various pump designs and selections. The following is a typical report that they would submit to their manager in a real world environment.

Pump Selection Summary

Still 1 (de-nC5) Condenser Service Pump

ANSI CPP21 4 x 3 x 13, single stage, end suction

Flowrate, Q = 580 gpm

Total Head = 172 feet

NPSHa = 16 feet

Column Height, hc = 134 feet

Condenser Height, hcond = 28 feet

NPSHr = 10 ft

Still 2 (de-butanizer) Condenser Service Pump

ANSI CPP21 1.5 x 1 x 6, single stage, end suction

Flowrate, Q = 55 gpm

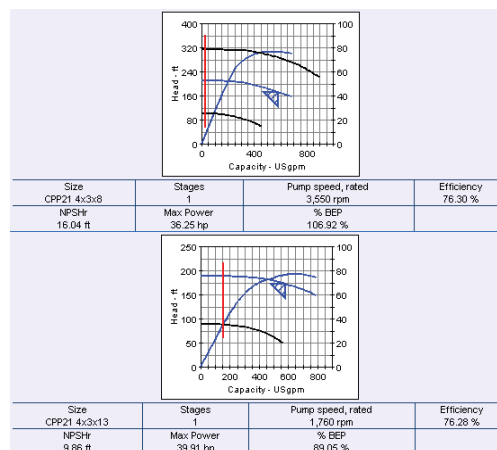
Total Head, h = 104

NPSHa = 8 feet

Column Height, hc = 55 feet

Condenser Height, hcond = 20 feet

NPSHr = 6 feet



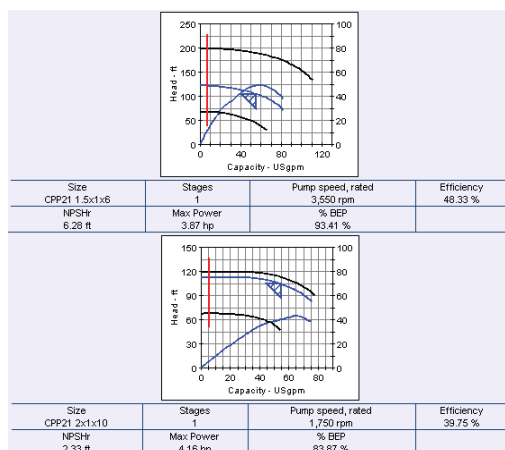
Detailed Description and Assumptions:

Using the Global Proposal System from Ruhrpumpen, two possible pump selections for each condenser service were selected. For de-nC5 Still 1 the following two options were proposed:

While several other pump selections were generated by the system, we chose to limit the selection to these two due to the horsepower requirements and best possible efficiency. Ultimately, the decision was made to use ANSI CPP21 4x3x13 (the bottom image). Although this pump is specified to operate at its maximum impeller diameter, it offers a lower NPSHr. In order to feasibly incorporate the top pump into our system, we would need to raise the condenser, which would be expensive and unnecessary. The bottom pump also offers equal efficiency, and leaves adequate operating room during the start-up/shutdown procedures. Also, if operating conditions change, it is easier to cut a pump down with a lathe than to purchase a new impeller. On the other hand, the impeller size can not be increased with this pump. CPP21 4x3x13 was the best ANSI pump candidate – and because this pump is for chemical plant service, ANSI is recommended.

■ GPS TAUGHT IN UNIVERSITY

For de-butanizer Still2, the following two options were proposed:



Again, the pump selections were limited to these two options. The top image is the obvious choice, as the operating area in the bottom image lies above the efficiency curve. It also has lower horsepower, better efficiency, and has an adequate NPSHr. Thus, the decision was made to use ANSI CPP21 1.5x1x6 (the top image).

The following flow parameters were determined for the respective condenser in each column. The Still layout was assumed to have an overhead condenser which sits 30 feet and 15 feet above the pump at the bottom of the column, for each respective column. The pumps suction takes liquid from the condenser and pumps it back to stage two of the column:

| | Still 1 (de-nC5) | Still 2 (de-But) | |
|--------------------------|------------------|------------------|--------------------|
| Mass Flowrate | 51 | 4.6 | lb/s |
| Temperature | 127 | 97 | F |
| Pressure | 35 | 56 | psi |
| Density | 39.3 | 38.4 | lb/ft ³ |
| SG | 0.63 | 0.62 | |
| Viscosity | 0.24 | 0.24 | cP |
| Q Flowrate | 580 | 55 | gpm |
| HEAD CALCULATIONS | | | |
| Suction Friction Head | >1 | >>1 | ft |
| Outlet Friction Head | 4 | >>1 | ft |
| Fitting/Valve Head S | 11.5 | 11.5 | ft |
| Fitting/Valve Head O | 48 | 49 | ft |
| Static Head | 106 | 35 | ft |
| Cond. Pressure Head | 128 | 209 | ft |
| Stage 2 Pressure Head | 129 | 206 | ft |
| Differential Head | 0.4 | 3 | ft |
| Velocity Correction | 5.8 | 5.8 | ft |
| NPSHa | 16.5 | 8.2 | ft |

Head calculation was conducted by looking at all contributing factors. However, because this service is handling a liquid at its boiling point, the head calculation can be limited to static head minus the friction losses. This assumption proves to hold for these Still systems. The head essentially is the height of the column minus frictional losses. Also, for calculation of total head, the velocity correction term (5 ft/s to 20 ft/s) and differential head between the pressure of the condenser and Still stage 2 was able to be disregarded.

For calculation of the friction loss head, an online calculator was used <<http://www.freecalc.com/diafram.htm>> assuming of smooth stainless steel pipe. The suction side of pump for the Still1 condenser was calculated with 32 feet of 8-inch piping. The downstream side effectively feeds stage two of the column with 142 feet of 4-inch piping. For the Still 2 condenser service pump, the suction side consists of 25 feet of 4-inch piping. The downstream side has 63 feet of 2-inch piping.

■ GPS TAUGHT IN UNIVERSITY

Fittings and valve losses were calculated using the following rules of thumb: An isolation valve was placed on either end of the pump; two elbows were included on each side of the pump; and a control valve was included on the downstream side.

Table 2 – Fittings and Valves for Friction Loss

| Fittings and Valves | | Each | Total |
|---------------------|---------------|----------|-------------|
| 2 isolation valves | 3 psi each | 11 | ft 22 |
| 1 control valve | 10 psi each | 36.66667 | ft 36.66667 |
| 4 elbows | 0.25 psi each | 0.916667 | ft 3.666667 |

In order to calculate the respective densities, the following assumptions were made:

- 1) Still 1 – Assumed the density of pure i-pentane because the stream is 96% i-pentane
- 2) Still 2 – Assumed the density is due to a 50/50 mixture of butane and pentane (actual composition is 42% butane and 47% pentane)

The respective friction head was calculated under the following parameters:

- 1) Still 1
 - a. Suction, 32' of 8" steel piping
 - b. Outlet, 142' of 4" steel piping
- 2) Still 2
 - a. Suction, 25' of 4" piping
 - b. Outlet, 63' of 2" piping

As you can see, the students grasped how to calculate pumping system heads, how to select a pump using curves, and how to make a technical evaluation. This exercise provides them experience in these areas, particularly in the utilization of GPS as a selection tool. We look forward to hearing from these future engineers with their pump requirements after graduation.



CPP-21 PUMP