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FACTS & FIGURES - CHEMTECH WORLD EXPO 2019

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Vinay Pratap Singh
Business Unit Director
Roxul Rockwool Technical Insulation India Private Limited

Towards Circular Economy with Stone Wool Technology

In an exclusive interaction with Offshore World, **Vinay Pratap Singh, Business Unit Director, Roxul Rockwool Technical Insulation India Private Limited** says, "Due to the design of our stone wool production, it's possible to use materials and recycle stone wool that might otherwise be landfilled or down cycled."

“Due to the design of our stone wool production, it's possible to use materials and recycle stone wool that might otherwise be landfilled or down cycled.”

Kindly share the company's approach to sustainability through its 'Stone Wool Technology' and application in the oil & gas industry.

Across the full range of our products and operations, Rockwool is dedicated to enriching modern living. We strive to increase our positive impact on people and society by maximising our positive product impact and minimising our operational footprint. This is very much in-line with the United Nation's Sustainable Development Goals (SDGs), whether it's to reduce energy consumption, create healthier indoor environments or enable efficient food production, our stone wool plays a central role in creating a sustainable future.

In a circular economy, products should be used for as long as possible – and reused to the greatest extent possible when they reach the end of their service life. In Rockwool, we use a natural material, volcanic rock, to give back to nature. Thanks to the unique durability and resilience of our stone wool products, their thermal properties and dimensional stability do not deteriorate during their lifetime. Due to the design of our stone wool production, it's possible to use materials and recycle stone wool that might otherwise be landfilled or downcycled.

Insulation serves an important role in the oil & gas industry. As temperature control is crucial for oil and gas applications, the pipes, appliances, boilers and vessels in oil & gas plants need to be insulated properly to maintain its process temperatures from being affected by external conditions. Rockwool, with its smart stone wool fibre structure and overall flexibility, offers the highest possible protection against heat and energy loss, fire, noise and other unwanted influences. In fact, our stone wool technical insulation sold in 2018 can save energy in its lifetime equal to 57 per cent of the total annual energy use in the U.S. industrial sector.

What are the key products that are most in demand and the new products that your organisation has been bringing to the market?

Roxul Rockwool Technical Insulation strives to set the standard in innovative solutions, the most stringent quality and safety

requirements, built on our people's in-depth expertise in the oil & gas and petrochemical industries.

In the last few years we have introduced the ProRox product range which complies with all industrial insulation standards and are considered by many to be the most cost effective, thermally efficient insulation products currently in the market. The ProRox range consists of insulation products in the form of pipe sections, wired mats and slabs. Insulating industrial plants with ProRox products reduces energy consumption and heat losses and thereby delivers significant extra savings in energy, heating costs and carbon emissions.

In many industrial plants, corrosion under insulation (CUI) is undoubtedly one of its costliest problem, requiring major maintenance or driving up operating costs that run into billions of dollars annually. Rockwool through its innovation and cutting-edge approach, introduced the award-winning WR-Tech technology to mitigate the risk of CUI. This unique WR-Tech technology gives the ProRox pipe section products 5x lower water absorption, very low water-leachable salt content, allowing the insulation to dry faster and to be more durable.

How do you intend to stay ahead of the competition & what are the future growth plan to consolidate your presence in India?

Rockwool Group has more than 80 years of history since its first inception in Denmark and is today present in 39 countries with 46 manufacturing facilities. As part of this group, Roxul Rockwool Insulation India Private Limited has grown by leaps and bounds since its establishment in 2011 and continues to build on its strong presence in India through the trusted and recognised Rockwool brand. We aspire to grow faster than the overall market by building long-term customer relations, launching innovative new solutions and offering superior services while at the same time strengthening our distribution network.

Our new innovations in stone also create opportunities and solutions to help us address the biggest challenges facing our world today. Each of our products combines the 7 strengths of stone: fire-resilience, thermal

“Each of our products combines the 7 strengths of stone: fire-resilience, thermal properties, acoustic capabilities, robustness, aesthetics, water properties and circularity; to provide cost-effective and energy efficient solutions to protect the environment and a plant’s investment.”

properties, acoustic capabilities, robustness, aesthetics, water properties and circularity; to provide cost-effective and energy efficient solutions to protect the environment and a plant’s investment.

Tell us about the applications of technical insulations in the oil & gas industry across up, mid & downstream to be energy efficient?

The ProRox product line was developed to meet the most stringent quality and safety standards of the oil & gas and petrochemical industries. ProRox products have been tested according to the latest regulations and approved by all major classification societies that are critical to applications in upstream, midstream and downstream processes. Supported by our outstanding knowledge in technical specifications as well as expert tools such as Rockassist Asia and Procheck, we apply the ProRox products for a diverse temperature range to improve the energy efficiency and reduce emissions of a plant while protecting the long-term sustainability of its operations.

We also provide solutions for the marine and offshore industries through the SeaRox product line.

What is the market size of technical insulations globally and how is this domain evolving?

According to sources, the Indian insulation market is expected to witness a growth of 7 per cent amidst a steady economy, infrastructure projects, favourable government policies and a promising construction and industrial sector. Insulation market is positively expected to generate an increased demand for insulation materials in process industries and construction sector, alongside the reviving economy and rapid expansion growth in India. Moreover, with the government regulations and emphasis for people safety and improved energy efficiency, we anticipate tremendous potential for insulation demand in the coming years.

Report by Markets & Markets suggests that this segment is projected to grow from USD 7.6 billion to USD 9.2 billion by

2024. Which industries will drive the growth of insulation products and how much will come from the oil & gas industry?

Based on some sources, the top three industries will be chemical, oil & gas and power. Many companies are investing and venturing into oil & gas, whereas many more projects are at the planning stage. Robust growth of petroleum, chemicals and petrochemicals sectors along with infrastructure expansion is expected to generate steady growing demand for thermal insulation and fire protection products like Rockwool stone wool insulation.

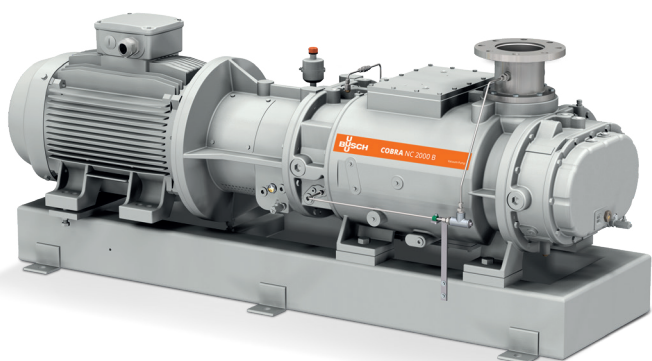
How are the compliance and regulatory norms changing worldwide for this domain across applications in the oil and gas industry? What kind of challenges do these create for customers and suppliers?

In consideration of the prevalent market conditions, there appears to be a trend towards developing India into a gas-based economy. As per the Minister of Petroleum & Natural Gas and Minister of Steel of Indian government, India will see a massive investment of USD 118 billion in oil & gas exploration as well as in setting up of natural gas infrastructure in the next few years as the country prepares to meet the needs of a fast-growing economy. As much as USD 58 billion will be invested by 2023 in oil & gas exploration and production, while another USD 60 billion will be put into the creation of natural gas infrastructure such as pipelines and import terminals. All these pipeline and equipment assets will need insulation to increase their thermal performance, which will have a positive impact on the insulation industry. The challenge for the insulation industry is to meet the demand brought about by this positive forecast as well as favorable government policies, and to grow in a sustainable manner while still meeting the quality and safety standards that is so critical for the oil & gas industry. ●

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Vijay Rajpurohit
Managing Director
Chemical Process Piping Pvt. Ltd

Keep it Simple ... Deliver what you Promise

In an exclusive interaction with Offshore World **Vijay Rajpurohit**, Managing Director, Chemical Process Piping Pvt. Ltd mentions about his belief to learn to innovate and to have a simple plan to deliver what is committed as the strongest growth drivers for the growth of company that has legacy of fifty years.

“**CPP is also working on Piping project for Abu Dhabi National Oil Company's (ADNOC) Waste Heat Recovery plant in Abu Dhabi along with several international projects.**”

Please apprise us about CPP's business portfolio for the entire Oil & Gas Industry?

CPP has the capability to design (including stress and surge analysis), manufacture and install GRE and GRP piping for Oil & Gas industry. For this industry, we make piping for applications such as Fire water, Produced water and corrosive Chemicals from 25 mm up to 2000 mm dia. CPP makes API 15LR Monogram pipes as per API Spec Q1.

As one of the leading companies for designing, manufacturing and installation of Pipes and Fittings for various industries, how do you differentiate from others through its offering solutions not only for maintaining high quality but also keeping intact the existing clients?

CPP has an unblemished history of serving clients for over 50 years including the best and biggest in the industry. We work on a simple plan, 'deliver what you commit'. It simple means CPP has is committed to deliver piping in the quality specified by the client and in time. Always!

CPP is always at the forefront of innovation and ensure to constantly improve our designs and manufacturing techniques. We follow a very simple plan of delivering what we commit helps us retain existing clients. Further, by constantly reaching out to new clients with personal visits and by other qualifications processes we acquire new clients. Both of these actions work in tandem.

How do you view the Oil & Gas Pipes & Fitting market in India vis-à-vis International especially for GRP and GRE?

The use of GRP and GRE in the oil & gas industry in India is still very low as compared to the global industry which is a clear indicator of

opportunity for growth. The challenge is to ensure that purchasers and the technical team of the Indian Oil & Gas industry open up to the idea of usage of GRE as a material of construction. We are doing our bit to reach out to them and over a period of time will see this to happen.

Tell us about the plans for expansion and bringing new technologies to the market.

CPP has always aimed to make more in the shortest possible time and deliver quality products that exceed the expectations of customers. We have continued to expand and add capacities as we move ahead in our journey. Learning has been a continuous process for us and we constantly continue to have dialogue with the best minds in the industry to stay abreast with the latest manufacturing and testing resources available in the global market. We have a dedicated product improvement cell with the team of experts that is constantly on learning spree about new technologies and also scouts for new technologies that can be acquired to enhance the product portfolio. These simple steps have been the strong driver for the growth of our organization and have enabled us to maintain an average rate of over 20 per cent per year. ●

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Unsupervised Machine Learning Drives Increased Capital Efficiency and Minimizes Geological Risk in E&P Operations

In this paper, authors demonstrate how the integration of Artificial Intelligence (AI) / Machine Learning (ML) technology using unsupervised genetics algorithms in Exploration, Field Appraisal, Development to increase capital efficiency and reduce geological risk and uncertainty.

The combination of increasing seismic dataset sizes and accelerated project timelines, combined with the increasing difficulty of finding and exploiting new reserves, means that developing new seismic interpretation technologies and approaches is critically important for the future of the industry. Genetic pre-interpretation processing algorithms inspired by the Human Genome Project have enabled the rapid evaluation of a large 3D seismic volume Oman resulting in recognition of previously unrecognized prospectivity, reducing geotechnical risk and uncertainty and optimizing the cycle time from Lead to Production.

3D Seismic and the Human Genome

Each waveform within a seismic volume is characterised by a unique suite of attributes (i.e. location, amplitude, neighbour trace shape, etc.). Similarly, DNA is comprised of a unique arrangement of base pairs. During the Human Genome Project, significant advances were made in the field of sequence analysis. Here we show how these advances can be leveraged to enhance the interpretation of 3D seismic data.

Genetic Processing Algorithms

Using Seisnetics® patented genetic processing algorithm to automatically segment seismic trace data into populations of related waveforms, artificial intelligence populations (known as 'GeoPopulations') are 'grown'

by the software from random and disordered seed points, eliminating any bias that might be introduced by user defined seed points.

The resultant GeoPopulations (which represent a group of genetically and spatially related waveforms), appear similar to a 'user-propagated surface', but critically are based on waveform characteristics rather than amplitude-based propagation used in the majority of E&P software packages, and are imbedded with seismic attributes.

The suite of embedded attributes includes 'Fitness', which represents a measure of the genetic similarity between any waveform in a GeoPopulation and the common waveform ('genotype') of that population. The fitness attribute is primarily calculated over the

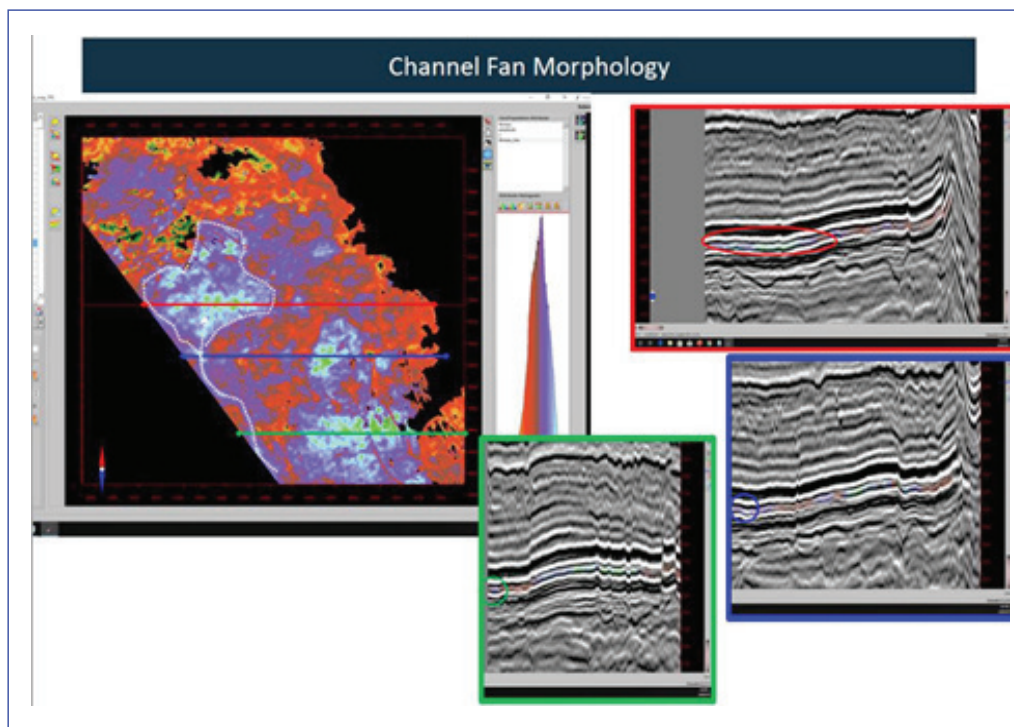


Figure 1 - Comparison of conventional attribute analysis and Seisnetics' Fitness attribute (EPI, 2019)

whole waveform but can also be calculated on a sub-waveform basis to enable reservoir-level seismic facies analysis. High Fitness indicates a direct genetic relationship between an individual and the genotype, whereas lower Fitness suggests a more distant relationship. Fitness maps highlighting areas of changing waveform morphologies associated with changing reflectivity geometries, which may be mature into geological facies maps.

GeoPopulation attributes may be analysed at sub-waveform level, allowing the interrogation of seismic facies and attributes at reservoir-scale. Targeting a specific portion of the waveform (and associated waveform Fitness and other attributes automatically calculated over the calculation window) can reveal more insights about structure and stratigraphy, enables the analysis of different depositional facies captured within a single seismic waveform and allows the focus on subtle changes in the sidelobes of the waveform (normally obscured by the dominant energy towards the centre of the waveform).

Outputs include a comprehensive analysis of the entire 3D Seismic Data Volume to identify and high grade leads and prospects with high resource potential in the near, medium and long term. This approach will allow an evaluation of the field geological risk (reservoir distribution, trap, seal, source, hydrocarbon migration pathway from source into reservoir) and initial possible hydrocarbon content/type evaluation (e.g. DHI evaluation) without disrupting your current workflow. The results will quickly delineate possible structural and stratigraphic targets. This will also provide the Production Asset with additional support in their appraisal and development drilling programmes. Optimally place horizontal wells and injectors / offtakes in Improved Oil Recovery/ Enhanced Oil Recovery (IOR / EOR) projects in areas of the field having the highest reservoir continuity to optimize the cycle time from concept to production. There will be strong focus on case studies and examples presented to demonstrate how the technology and approach serve to increase the probability of success leading to increased capital efficiency and profitability in several types of structural and stratigraphic environments around the world. ●

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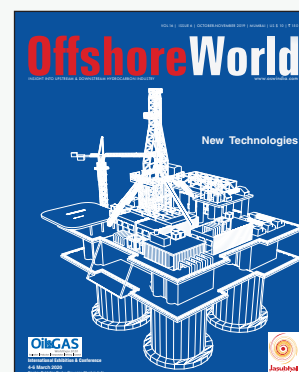
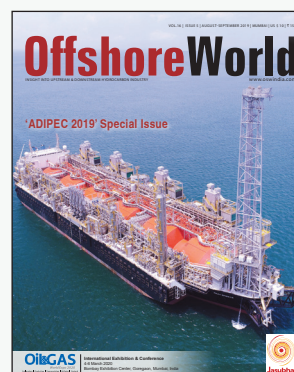
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Real Entrepreneurship Drag is to Own One's Own Destiny: Emergence of Bulk MRO Industrial Supply Pvt Ltd

By: Jayati Mukherjee

When we talk about today's front-runners of Indian Entrepreneurship league, the two very prominent young leads are being surfaced out. They are – Gaurang Shah and Devang Shah, owner of Bulk MRO Industrial Supply Pvt Ltd, a B2B space based startup and a one-stop-shop for all Industrial products. This Cofounder-and-Director-duo stands out for their openness to new ideas, risk taking aptitude, and outlook towards people's capability development. They are always right to be in readiness. Being the visionaries, their practices resemble with large corporates. In appreciation of this young-duo's talent, BulkMRO bagged ChemTECH Excellence Award 2019 in the category of 'Outstanding Achievement by Start-up'. The article narrates their entrepreneurial journey, which has a notable stretch in Oil & Gas sector along with other verticals.



Outstanding Achievement by Start up: Devang Shah and Gaurang Shah, Directors, Bulk MRO Industrial Supply Pvt Ltd

BulkMRO Industrial Supply operates at a B2B space as a one-stop-shop for all industrial products. Leading Silicon Valley investors viz Y-Combinator, Bain Capital and FJ Labs have funded this start-up, which has been reflecting its exemplary 500 percent per annum growth potential. With this, the start-up is poised to be the Alibaba for Indian market based enterprises.

Early Days

Both the brothers were born and brought up in Mumbai. Their bon voyage started after successful completion of their school days at the age of around 15-16 years, when they head out for their education at USA. They completed their graduation with dual degrees – Finance from the Wharton Business

School, and Electrical Engineering from the Moore School of Engineering at University of Pennsylvania. This revered education equipped both the brothers with a very good global exposure. Subsequently, Devang pursued a career on Wall Street Trading Credit Derivatives at Deutsche Bank and Citigroup; and Gaurang worked as a consultant at McKinsey & Co's New York office. He also rendered his expertise at Bain Capital. The brother-duo returned India in 2007. Those were the days when retail and telecom boom had set in, mobile revolution started happening, and transition from blackberry to android was about to phase in. In short, India was on the track of progression compared to what it was ten years ago. And Shah Brothers did not make any delay to grab the opportunity.

Why Entrepreneurship?

“For us the real entrepreneurship drag was: how do we actually own our own destiny”, said Gaurang Shah and Devang Shah

In Gaurang and Devang’s own words, “the real drag of entrepreneurship was: how do we actually own our own destiny”. With this belief, they had decided to keep concentrating on factorials that translate into high impact business in the country. Country’s steady-growing economy, which in turn had generated ample opportunities to explore, and the availability of quality human resource for workforce development have brought the scope for them.

First Venture

Digital Signage Network (DSN) was Shah Brothers’ first initiative. It is a media-tech company funded by Sequoia Capital. In India, at the initial days, DSN was one of its kind advertising network. However, at the global landscape, similar signages were in existence, more so in US and New York. With a presence in over 1500 locations, the venture has captured a large share of Indian market covering areas like malls, cafes, restaurants, food courts, and large & small format retail outlets. Initially this endeavor was planned as a summer project; however, with a good surprise, it took a positive lift. Atria Mall at South Mumbai was the starting point. Going forward, as the momentum kicked in, the venture started scaling up by winning one after another projects viz DLF, Café Coffee Day, McDonalds, Railways, etc.

Emergence of BulkMRO

“As in Amazon a consumer can buy five different things of five different category and all are delivered to that consumer majorly in one shot, BulkMRO is doing the same thing for Corporates in B2B space by becoming a consolidation hub where convenience comes as one box.”

BulkMRO was conceptualized and emerged with the intent of starting a very scalable, platform driven, and high impact business. The Cofounder-duo identified long-tail of suppliers as the biggest procurement challenge for large companies. Long-tail of suppliers generally deciphers more inwards, more invoices, dealing with too many people, and more administrative activities. On top of it, if the transactions are manual, it further leads to increasing errors and inefficiencies, thus finally causing cost overrun.

To eradicate this difficulty, BulkMRO came up as the consolidation hub where convenience comes as one-box. It started consolidating the entire end-to-end procurement process by stringing together all the sub-processes viz automatic

indenting, automatic order generation, automatic order placement, as well as delivery on-schedule. As in Amazon a customer can buy five different items in five different categories and all can be delivered majorly in one-shot, BulkMRO does play the similar role for corporates at B2B space. Usually large MNCs and corporate houses, who are dealing with brown-field or green-field expansion or of similar category, prefer their plate to be offloaded from regular small and standardized procurement activities. In its place, they intend to prioritize and focus on crucial revenue-generating part of procurement. As an instance, a client into 1000 crore steel plant business prefers to focus more on big items. And to streamline that, they would prefer to outsource the procurement activities for small value standardized items – as for eg, laboratory equipment of around two crores. This would help them to save their man-hours as well as unnecessary hassles and liabilities, which could have resulted had their own workforce been deployed.

Competitive Edge

WoW Factors of BulkMRO that Generate almost 90% Repeat Rate:

- Enterprise focused and large corporate focused approach
- Online presence
- End-to-end digitized procedure
- Innovative technology back-up
- Strong sourcing
- Customer centricity
- Sales Team Extension Functionality for their Vendors / Suppliers
- Procurement Team Extension Functionality for their Customers

Being a horizontal specialist, BulkMRO provides solution for their customers across the length and breadth of their requirement – in short, in getting pin-to-plain on a single platform. They have integrated right suppliers, products, logistics, warehousing (including transition from suppliers’ warehouse to customers’ warehouse), and storage thus generating savings and efficiency in entire supply chain.

In India, even today, the procurement process majorly follows a low-tech way through excel files, manual order placement, and with no real-time tracking. The start-up identified this short-fall and built up on that with fully digital, technology-enabled, and transparent end-to-end procedure ranging from indenting to delivery. Their full-fledged online presence put their customers at ease and convenience for sourcing the requirement. Thanks to their advanced technology adoption, their customers can track and trace the orders they place. Customers are free from legal worries due to its reliability, adherence to compliance, and following of taxation rules. This value addition has enabled them to win over 200 corporate customers so far.

Competitive Positioning

Director-duo mentioned, “We majorly cater to Oil & Gas, Power, Manufacturing,

FEATURES

and Pharma sector with a focus on large- and mid-sized companies as well as on PSUs. In Oil & Gas industry, we have kept our eyes fixed on offshore. We are also gauging the expansion possibility in city gas distribution, refinery, and pipeline work. Lots of new projects are coming up in upstream, midstream, downstream, and gas-sector – mainly in LPGs and LNGs, which we have been considering as opportunity for us to scale up”. They added, “Almost USD 100 bn expansion is expected in India over next 5 years”.

As far as clientele is concerned, the start-up has acquired both global and national clients. Global clients buy in their concept without much inhibition as those clients are already acquainted with similar emergence. However, national clients are needed a shift in their mindset from what they have been doing and experiencing since ages. Nonetheless, it’s worth mentioning that buying in BulkMRO’s proposition is not an easy task, even for large corporates.

“Onboarding us leads to off-loading of thousand other vendors whom those corporates have been bonded with since years. Here comes the role of our commitment towards long-term presence and sustainability”, Gaurang added. “We are now happy to mention that more & more clients have started appreciating our concept and the value addition, which have been contributing very positively and incrementally to our in-bound business development.”

As far as market competition is concerned, the Director-duo considers existing small-scale solo suppliers too as their competitors, along with aggregators. They foresee enough room for their growth as well as for each player without affecting the others. And the contributing factor is the existence of sufficiently incremental market growth and demand.

Devang added, “even the giants like Amazon and Flipkart take up a small fragment of the market. Online retail has captured 59 – 60 percent of the US retail market. Amazon (both online and offline) has so far captured about 10 percent count. And in Indian context, this count is around 5 percent. If top companies like Big Bazar, Pantaloons, D-Mart, Reliance Retail, Amazon, Flipkart are consolidated together, still they constitute a small fragment of the entire market. Now this is the scenario for B2C market space. In B2B market space, in Indian context, so far there is no organized aggregator. A few can be named viz 3M, Honeywell, etc; but they are not aggregators. They sell their own products. Therefore, it can be said that we have been pioneering for Indian aggregators at B2B space”.

Global Presence

The start-up has established their presence in seven markets. Other than India, they have put their feet on the streets of Middle-East, South-Asia (Srilanka & Bangladesh), Kazakhstan, Commonwealth of Independent States (CIS), Russia, and South-East Asia. The Director-duo feels that these markets are poised for such kind of disruption. Europe and US have already been explored. And for coming days, their focus is on Nigeria, Africa, and South-Africa. However, they are yet to build-up their visibility in South America.

Vendor and Customer Engagement

So far the start-up has on-boarded more than 3000 vendors. Shah Brothers gladly mentioned, “We consider this aspect as our trump-card. We act as a sales team extension for our vendors by bringing orders for them. The vendors don’t have to put their feet on street to deal with multiple customers individually. Our platform is enabling them to connect with more than 200 companies, and to alleviate all the logistical, compliance, and payment related hassles. From customers’ stand point, we are their procurement team extension. So for both vendors as well as customers, associating with us is a win-win proposition.”

Big Player vs Small Player Integration

For critical items and components, the start-up prefers to tie up with bigger players to avoid perforation in safety and compliance.

Gaurang said, “it is acceptable if the margin goes little bit up and down for the sake of maintaining safety and compliance.”

The Director-duo is very protective of their customers’ convenience and faith on them as a reliable supplier and authentic & real deal provider with on-schedule delivery. And this they want to maintain with consistency. However, for not-so-critical and standardized items, they have kept their options open for small players. This provides them the scope for cost-optimization, which they pass on to their customers.

Logistics Integration

The start-up has adopted a strategy of integrating third party logistics providers and developed a very good ecosystem with them, instead of recreating the existing wheel. They have collaborated with dozens of logistics service providers having expertise to their own respective domains catering to logistics, warehousing, pick-n-packs, and actual movement of the material.

Workforce Development

BulkMRO has grabbed a troop of promising young workforce. Their journey started at Jan’2015 with three people, followed by an expansion of up to almost 160 people as on date. The venture has on-boarded some partisans from the aggregators of West, having specific domain experience to this kind of industrial products & tools; and the team building is being done through them by using their best practices. As a part of their people development policy, training is also being accentuated on.

Future Thoughts

Shah Brothers strongly intend to practice humble strategy. Along with new acquisition, they intend to keep executing better with existing clients –

- in terms of products are being supplied to them
- in terms of customer centricity

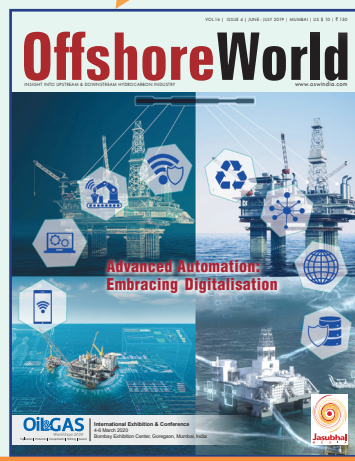
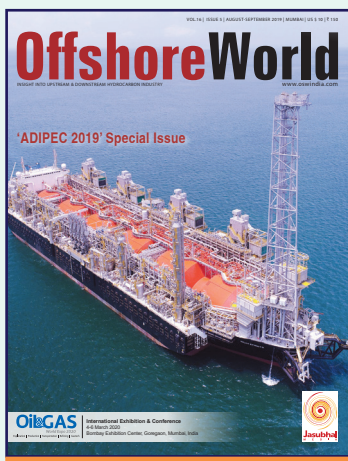
Their goal is to become indispensable & default options to their clients. ●

OffshoreWorld

INSIGHT INTO UPSTREAM & DOWNSTREAM HYDROCARBON INDUSTRY

Offshore World is an all-encompassing magazine for the hydrocarbon and allied industries. A bi-monthly magazine, launched in December 2003, Offshore World disseminates authentic, critical and well-researched information on global hydrocarbon industry innovations. The magazine offers latest and strategic information on the upstream and downstream hydrocarbon industry. The endeavour of Offshore World is to become a vehicle in making "Hydrocarbon Vision 2025" a reality in terms of technologies, markets and new directions, and to stand as a medium of reaction of the achievements and aspirations of Indian hydrocarbon industry.

Circulation: 28,000

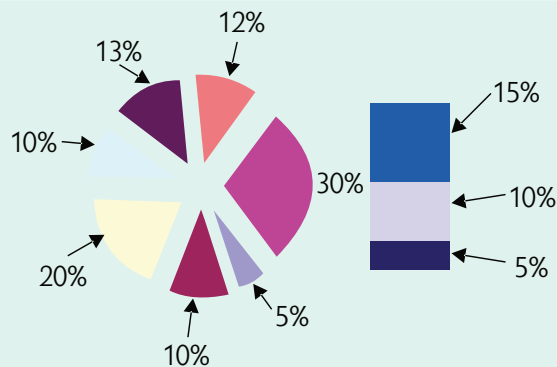


OSW Region-wise Presence

- 53% Western Region [including Mumbai, Gujarat, Pune, etc]
- 23% Northern Region [including Delhi, UP, etc]
- 10% Southern Region [including Bangalore, Hyderabad, Chennai, Coimbatore, etc]
- 9% Eastern Region [including Kolkata, Assam, etc]
- 5% International [includes USA, MiddleEast, Russia, Brazil, Iran, China, Germany, Italy, France, etc]

OSW Reader's Profile

- | | | |
|--|---------------------------------|---------------------------------|
| • CEOs & Senior Management of Oil Companies | • Operations Managers | • R&D Personnel |
| • Petroleum Engineers & Refineries Contractors | • Technical Managers | • Industry Consultants |
| • Project Managers | • Safety Managers & Engineers | • Engineering & EPC Consultants |
| • Refining & Pipeline Engineers | • Purchase Managers | • Indian & Overseas Industry |
| • Corrosion Control Engineers | • Marketing Executives | • Associations |
| | • Pollution Control Specialists | • Training Institutes |



- | | |
|--|---|
| Hydrocarbon Exploration | Refining and Marketing Companies |
| Hydrocarbon Processing | Plant, Machinery and Equipment Providers |
| Drilling and Equipment Manufacturers | Technology Solution and Service Providers |
| Development and Production Companies | Safety, Health and Environment |
| Transportation and Logistics Companies | |

OSW Target Segments

- 5% Hydrocarbon Exploration
- 10% Hydrocarbon Processing
- 20% Drilling and Equipment Manufacturers
- 10% Development and Production Companies
- 13% Transportation and Logistics Companies
- 12% Refining and Marketing Companies
- 15% Plant, Machinery and Equipment Providers
- 10% Technology Solution and Service Providers
- 5% Safety, Health and Environment

Process Equipment Efficiency and Environmental Footprint Management

Over the years, when the oil-and-gas industry has come under the scrutiny for causing negative environmental impact, attaining process efficiency has also come in the limelight. Along with necessitating the time- and cost-economy feat, the need of the hour for the industry is to achieve sustainability. The author, here in this article, speaks about the responsible production with recycle-replace-reuse approach to strike the right balance.

Process efficiencies not only entail achieving time- or cost-economy, but also need to be sustainable and generate a positive effect on the environment. This has gained due prominence against the backdrop of developing sustainable goals. A lot is being done, but a lot more to achieve with the prevailing scope.

Oil is much more than only being humankind's most significant energy source. It provides employment and runs the economy of many countries in the world. Petroleum products serve as the feedstock for several consumer goods, thus playing an increasingly relevant role in people's lives. Oil-and-gas generates significant revenue in taxes and duties to Governments, globally. Thus, the sector clearly has an overarching influence over the world's economy.

Producing responsibly to strike the right balance

As a responsible supplier, the process equipment industry can ensure to adopt techniques that can positively impact our carbon footprint, while manufacturing the static process equipment for the oil-and-gas sector. By simply improving the existing processes, we can balance both the economic and environmental aspect of production activities.

Since the last decade or so, the awareness has been increasing about the fact that cost effectiveness need not dictate the process efficiency implementation. Apart from deriving economies, improvements should also promote conservation of ecology and natural resources.

“Over the years, the oil-and-gas industry has come under scrutiny for its environmental impact. Pollution is the most adverse impact caused by the activities that oil-and-gas industry carries on. From exploratory activities to production, and from refining to transportation, all stages of oil-and-gas production end up with wastewater, gas emissions, and solid waste.”

However, over the years, the oil-and-gas industry has come under scrutiny for its environmental impact. Pollution is the most adverse impact caused by the activities that oil-and-gas industry carries on. From exploratory activities to production, and from refining to transportation, all stages of oil-and-gas production end up with wastewater, gas emissions, and solid waste.

The industry has already been implementing the initiatives such as switching to cleaner fuel with less sulphur content, and maximising the use of renewable energy. However, there is scope for more. The simple and time-tested 3R principle of Recycle – Replace – Reuse can form the base for various initiatives for effective environmental footprint management.

Recycle

For years, careless disposal of process-waste has been a significant cause of environmental degradation. Earlier, the organisations used to consign non-hazardous waste to landfill. However, they are now investing in recycling methods of solid wastes. When it is recycled, non-hazardous waste reduces the pressure on land resources, and thereby consequently reducing the damage to human health and the environment.

Hazardous waste, at the very first place, needs treatment to reduce the toxicity. There are various thermal, physical, chemical, and biological treatment technologies that have been developed for this purpose. Once treated, the waste can be disposed safely through incineration, oxidation, or underground injection wells.

“The industry has started implementing the initiatives such as switching to cleaner fuel with less sulphur content, and maximising the use of renewable energy. However, there is scope for more. The simple and time-tested 3R principle of Recycle – Replace – Reuse can form the base for various initiatives for effective environmental footprint management.”

Untreated water, discharged during different processes, is unfit for human consumption in any form; and when released into nature, it can easily cause widespread ecological damage. Hence, it can be better utilised by sending it back into the system. For instance, water used during hydro-testing of equipment, for pickling & passivation of equipment, and for many other purposes can be recycled back into the system. There are many other ways in which the used water can be recycled back into the system.

Replace

Energy is a key component of the manufacturing process. In addition to using conventional grid power, manufacturing facilities can install captive solar power plants, wherever feasible, to offset some of their power requirements. Using renewable energy will help to reduce the consumption of conventional electricity, which, in turn, decreases the need for fossil fuels. The same situation applies to the usage of traditional fuel. Piped natural gas can be used to fire furnaces for heat treatment instead of diesel, which is the traditional fuel.

Similarly, switching to multi-point burners will reduce the time and fuel consumed by the heat equipment, thus positively impacting both – the energy conservation and the productivity. Asbestos-based gasket sheets can also be replaced with non-asbestos based ones, thereby reducing hazardous waste.

Thyristor-based machines are generally used for industrial welding. These machines consume a lot of energy. Switching to inverter-based welding machines can lead to drastic energy savings.

Efficiencies can also be derived by adopting digitalisation instead of manual processes. It is a general practice to circulate manufacturing drawings across the shop floor, for the use of various departments. Manual intervention can be reduced by shifting to a digital drawing display, which in turn mitigates worker fatigue and reduces the human-error possibility.

Reuse

Another important method of reducing the carbon footprint is to re-introduce materials used earlier. For instance, by installing a filtration unit in the machine shop, used hydraulic oil can be reclaimed, thereby reducing the need for disposal. Similarly, the oil used for cutting operations can also be reclaimed and reused.

Less waste means less pressure on the environment. Needless to add, it also leads to lower consumption and hence, lesser replacement costs.

Conclusion

In line with the examples cited above, the process-equipment industry has been consistently and continually increasing its efforts to manage its environmental footprint. However, it is imperative for the industry to re-calibrate its strategies for further improvement of its quality towards augmentation of environmental aspects, occupational health-and-safety, and energy management systems. This is not only to ensure the process efficiency, but also to align itself towards the development of sustainable goals. ●



Reginaldo Dsouza
AVP & Head – Sales & Marketing
Godrej Process Equipment

Contracts Management in Oil-and-Gas, Power, Refining-and-PetroChemicals, EPC Sectors

Contract management is a very essential aspect of project execution when dealing with external parties, as this gives the foundation of smooth and legal-issue-free transactions while maintaining a good working relation. In this article, the author, describes the contract management procedure

Contract management is the process that enables both parties to a contract to meet their obligations in order to deliver the objectives required from the contract. It also involves building a good working relationship between the customer and the service provider. It continues throughout the life of a contract and involves managing proactively to anticipate future needs as well as reacting to situations that arise.

One of the key aims of contract management is to obtain the services as agreed in the contract and to achieve value for money. This means optimizing the efficiency, effectiveness, and economy of the service or relationship described by the contract, balancing the costs against risks and actively managing the customer & service provider relationship. Contract management may also involve aiming for continuous performance improvement over the contract life-span.

Getting the contract right

This guide concerns customer activities following the signature of a contract, not the procurement process that leads up to the signing of a contract. However, as mentioned previously, the foundations for contract management are laid in the stages before the signing of the contract, including the procurement process. The terms of the contract should include an agreed level of service, pricing mechanisms, service provider's incentives, contract timetable, means to measure performance, communication routes, escalation procedures, change control procedures, agreed exit strategy and agreed break options, and all the other formal mechanisms that enable a contract to function.

The above-mentioned aspects of a formal contract enable the framework formation around which a good relationship can grow. If the contract was poorly constructed, a successful relationship formation would be much more difficult. The contract negotiation process must consider the requirements for contract management. It is vital to build a contract that not only clearly identifies the obligations of the service provider (and that of the customer), but also enables a productive relationship to be built upon good communication and

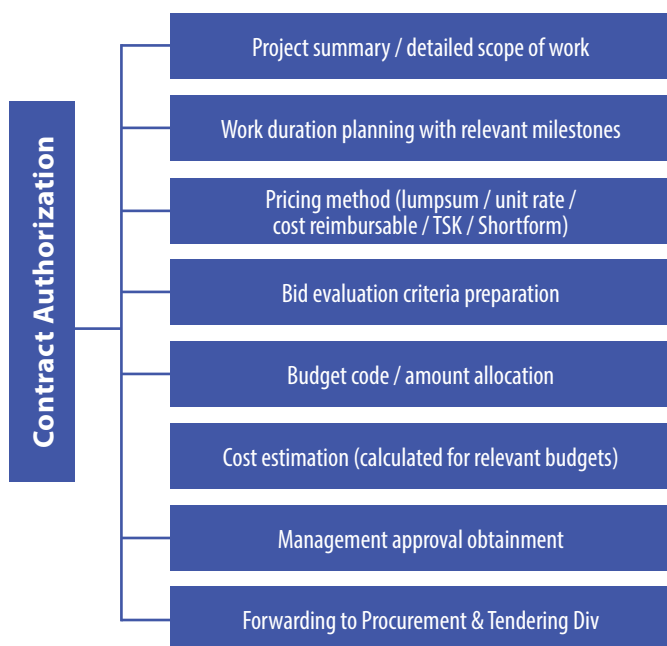
mutual trust. While the contract must be built upon a firm, formal, and legal foundation, it should not be so restrictive that it precludes flexible, constructive management of the relationship between the customer and the service provider.

Critical success factors

In our experience, the following factors are essential for good contract management:

- **Good preparation:** An accurate need assessment helps to create a clear output-based specification. Effective evaluation procedures and selection will ensure that the contract is awarded to the right service provider.
- **The right contract:** The contract is the foundation for the relationship. It should include aspects such as risk allocation, required service quality, value for money mechanisms, and the procedures for communication and dispute resolution.
- **Single business focus:** Each party needs to understand the objectives and business of the other. The customer must have clear business objectives, coupled with a clear understanding about the contribution of the contract. The service provider must also be able to achieve their objectives, including making a reasonable margin, from that contract.
- **Service delivery management and contract administration:** Effective governance will ensure that the customer gets what is agreed, along with the required quality level. The performance under the contract must be monitored to ensure that the customer continues to get value for money.
- **Relationship management:** Mutual trust and understanding, openness, and excellent communications are as important to the success of an arrangement, as the fulfillment of formal contract terms and conditions.
- **Continuous improvement:** Improvements in price, quality, or service should be sought and, wherever possible, built into the contract terms.

Flow Chart No. 1: Contract Authorization



- **People, skills, and continuity:** There must be people with the right interpersonal and management skills to manage these relationships on a peer-to-peer basis and at multiple levels in the organization. Clear roles and responsibilities should be defined, and continuity of key staff should be ensured as far as possible. A contract manager (or contract management team) should clearly be designated in the procurement process.
- **Knowledge:** Those involved in contract management must understand the business fully and know the contract documentation inside out (“intelligent customer” capability). This is essential to understand the problem implications (or that of opportunities) over the contract lifespan.
- **Flexibility:** Contract management usually requires some flexibility on both sides and a willingness to adapt the contract terms to reflect a rapidly changing world. Problems are bound to arise that could not be foreseen when the contract was awarded.
- **Change management:** Contracts should be capable of change (with respect to terms, requirements, and perhaps the scope); and the relationship should be strong and flexible enough to facilitate it.

“The contract negotiation process must consider the requirements for contract management. It is vital to build a contract that not only clearly identifies the obligations of the service provider (and that of the customer), but also enables a productive relationship to be built upon good communication and mutual trust. While the contract must be built upon a firm, formal, and legal foundation, it should not be so restrictive that it precludes flexible, constructive management of the relationship between the customer and the service provider.”

- **Proactivity:** Good contract management is not reactive, but aims to anticipate and to respond to future business needs.

What can go wrong and why?

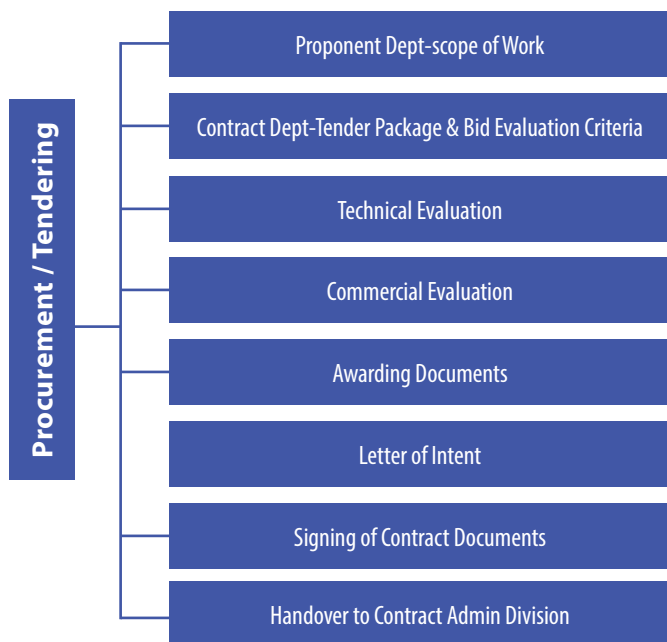
- If contracts are not well managed from the customer side, any or all of the following may happen:
 - Service provider is obliged to take control, resulting in imbalanced decisions not serving the customers’ interests.
 - Decisions are not taken at the right time, or not taken at all.
 - New business processes do not integrate with the existing processes, and therefore fail.
 - People (in both organizations) fail to understand their obligations and responsibilities.
 - There are misunderstandings, disagreements, and underestimations.
 - Too many issues with inappropriate escalations.
 - Slow progress or a seemingly inability to move forward.
 - Non-realization of intended benefits.
 - Missed opportunities to improve performance and thus value-for-money.

Ultimately, the contract becomes ineffectual.

- There are several reasons why organizations fail to manage contracts successfully. Some possible reasons include:
 - Poorly drafted contracts
 - Inadequately assigned resources to contract management
 - Customer team not matching with the provider team, in terms of – either skills, or experience, or both
 - Mismatch between people and position, thus leading to personality clashes
 - Improper understanding of context, complexities, and dependencies of a contract
 - Failure to check the assumptions made by service provider(s)
 - Not having clarity about authorities or responsibilities with respect to commercial decision making
 - Lacking in performance measurement or benchmarking made by

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Flow Chart No. 2: Procurement and Tendering



the customers

- Focusing on current arrangements, rather than – what is possible or potential for improvement
- Failure in monitoring and managing the retained risks
- Various forms of contract agreement documentation are:
 - Consultancy services based on service order
 - Drilling rigs & vessels
 - General services
 - Hiring of specialist
 - Inspection & QA/QC based on service order
 - IT lumpsum projects including maintenance & support
 - Leased / rental of equipment
 - Maintenance & overhaul
 - LSPB – Lumpsum project based on unit rate / lumpsum / lumpsum turnkey (LSTK)

Management of Contract Start Up

After a contract has been signed there are a number of matters that should be addressed to provide the foundation for successful contract

management. An early step is to ensure that sufficient resources and senior management support are available to manage the contract. It is equally important to understand both the contract provisions and contractual relationships at the outset. In the case where the contract manager has been involved in earlier procurement phases, we expect that the contract manager will already have knowledge of issues, relevant to implementation.

The following checklist should assist the contract management team with providing a better understanding of the contract and can be used as a basis for developing an effective working relationship with the service provider.

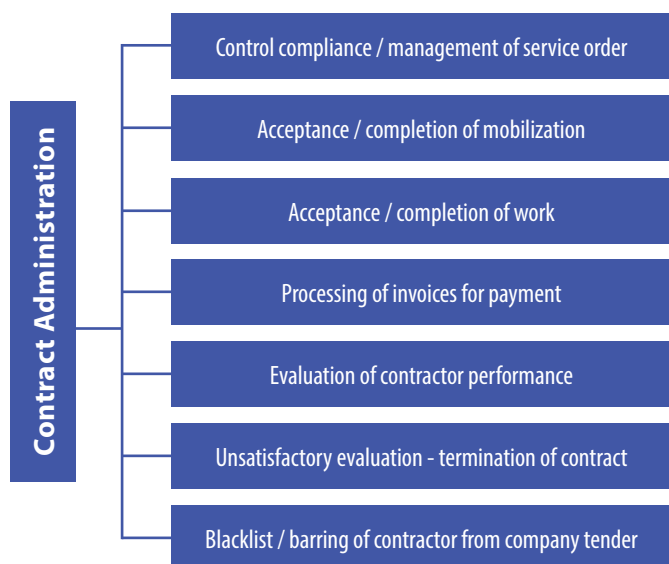
- **Analyze the contract and agree the service provider's understanding of the contract**
 - Identify deliverables and how their achievement will be measured. Ascertain timeframes, particularly any critical deadlines.
 - Understand payment arrangements, including links between payments and performance.
 - Identify the roles and responsibilities of both parties and allocate responsibilities within the customer organization.
 - Confirm agreement with the service provider, especially in relation to any sensitive matters.

We expect that many customers may have certain procedures that must be followed before and during contract negotiation and prior to contract execution. The procedures may vary depending on the contract terms, the service provider, and the project type.

- **Gain an understanding of the contract background and the relationship with the service provider**
 - Discuss the relationship that has been developed with the service provider over the preceding phases of the contracting cycle.
 - Meet the service provider as necessary to further develop the relationship and to address the issues that may impinge on effective contract management.
 - Establish any required systems for monitoring and reporting, protocols for communication and recordkeeping arrangements
 - Establish contract management or data collection systems or processes.
 - Draw up a monitoring plan or checklist covering key timelines, critical deliverables, and performance reporting priorities.

“After a contract has been signed, a number of matters are to be addressed to provide the foundation for a successful contract management. An early step is to ensure that sufficient resources and senior management support are available to manage the contract. It is equally important to understand both the contract provisions and contractual relationships at the outset.”

Flowchart 3: Contract Administration



- Develop the required procedures / protocols and establish recordkeeping arrangements.
- **Obtain or confirm licenses in relation to intellectual property that have not already been obtained**
 - Ensure that relevant confirmation has been obtained and confirm all documentation is up-to-date.
 - Store the evidences of these matters appropriately.
- **Brief the team members or stakeholders**
 - Set out meeting arrangements for the entire contract life-span.
 - Confirm stakeholder involvement and their requirements for information.
 - Set up committees or working groups, and to brief them.
 - Brief the contract management team about their roles and responsibilities.

● **Unresolved issue management**

In many a cases, all the issues don't get resolved during contract signage phase, and these need timely addressal during contract initiation. These issues can create problems when managing a contract, if not dealt properly and at the correct time.

In situations, where the issues have not been fully resolved at contract signature, the contract manager should:

- Identify and record the agreements / arrangements made by the parties during contract negotiation.

- Identify and record the contract aspects potentially left for future development.
- Identify and record the contract aspects subject to some other processes, for example, third party approvals.

The detailed review of the contract at contract start up may also identify issues that require clarification or elaboration in the contract. It is important to address such issues promptly. This may require a contract variation or exchange of correspondence.

Transition

For some contractual arrangements there will be a transition phase. The duration of this phase can range from a few days to several months. The objectives of this phase are to:

- Ensure a smooth transition to the new service provider by minimizing the risk of a reduction or loss of services, and its impact on end-users and other stakeholders
- Establish relationships, systems, and procedures that will be used during the entire contract life-span to complete the transfer of information and/or assets to the new service provider.

For straightforward contracts, there may be a number of one-off tasks that need to be appropriately planned and resourced. In complex contractual arrangement, the transition phase may require a detailed plan and / or some other formal documentation to ensure all relevant matters are considered as well as addressed. The way the customers manage the transition phase, will generally be an indication to the service provider about the way the whole contract is to be managed. If, for example, the customer adopts a lenient approach towards the non-achievement of transition targets, the service provider may take this as a signal of how the customer will deal with the underperformance in general.

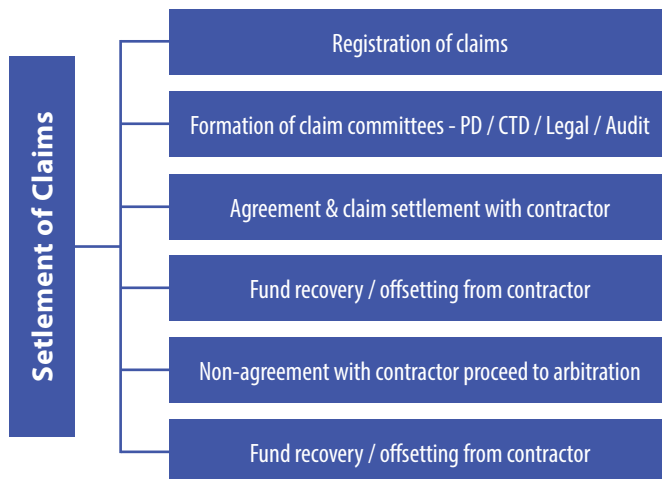
Post-transition review

At the end of the transition phase it is important that a formal assessment is undertaken of overall contract performance. The extent and method adopted will depend on the complexity of contract deliverables and how important the results of the transition are to the success of the contract over its life. For example, where the transition is being used to finalise details of contract deliverables and performance measures, the outcome of the transition will dictate the final form of the contract and how it will operate in practice.

“The detailed review of the contract at contract start up may also identify issues that require clarification or elaboration in the contract. It is important to address such issues promptly. This may require a contract variation or exchange of correspondence.”

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Flowchart 4: Claim Settlement



The post-transition review should also be used to review the customer's contract management arrangements, including resource requirements.

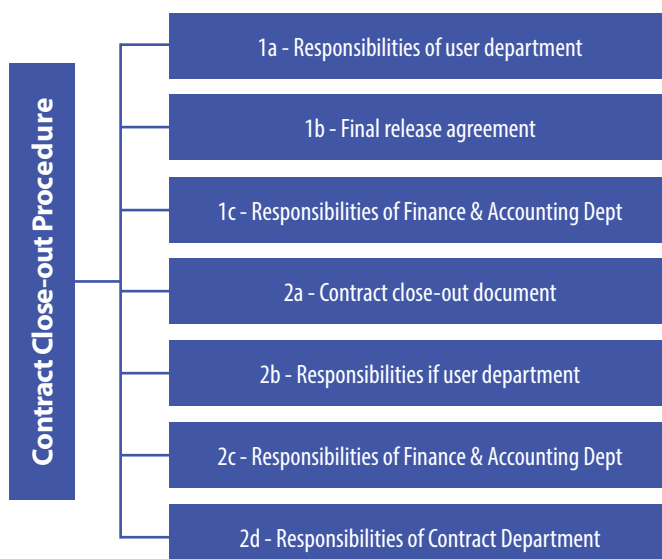
Governance arrangements

There is no one prescribed governance structure for managing the contract / relationship. The structure largely depends on the size and scope of the deal, and the organizational structure of both the customer and the service provider. The names of the groups / committees within the governance structure are also deal or client specific.

A common structure is for the hierarchy establishment of working groups / committees with representatives from the service provider and the customer, whose roles and remit are clearly spelt out to ensure that the progress is reviewed through plenty of interaction. There will usually be committees at executive, service management, operational / project management levels.

The parties need to understand and comply with the governance

Flowchart 5: Contract Close-out Procedure



arrangements, and in particular, the following issues should be considered:

- Time frame for establishing committee meetings
- Agenda for each meeting and the schedule to distribute that agenda, prior to meeting, with necessary reading material
- Role of the Chairperson
- The process for documenting the minutes of the meetings (MoMs)

In order to manage the contract effectively, all actions, responsibilities, and accountabilities should be tracked and managed if the contract is to be managed effectively, along with notification to the other party about any change in the committee representatives.

Briefly, in a nut-shell the life-cycle of a Contracts Management are explained with the following flow-charts depicting each of the phases.

- Contract Authorization (flow-chart No.1 attached)
- Procurement & Tendering (flow chart No.2 attached)
- Contracts Administration (flow chart No.3 attached)
- Claims & Settlement (flow chart No.4 attached)
- Contract Close Out Procedure (flow chart No.5 attached)

The stages of Contracts Management life-cycles are:

Conclusion: On receipt of final release agreement, Contract Department will enter this information on the contract control file, so that – for the purpose of developing future bid slates – the same contract will no longer reflect as a part of the contractor's current work load, though it will still remain open for payment purposes.

On receipt of a close-out document, contract department will change the contract status to close-out and forward the second copy of this document to Finance & Accounting Department. The final release agreement or close-out document shall then be placed in the archives of completed contracts. ●



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Unlock Critical Clues to Maximize Profitability in Refineries

In this industrial game of Cluedo to maximize profits, refiners need to leverage the best innovation can offer. This is crucial in the volatile economy today, as profits can be razor thin. Owner operators need to adopt process simulation software to mitigate relentless business complexity – driven predominantly by accelerated globalization, increased market volatility and the latest legislation. To stay ahead of the competition, refineries need to achieve operational excellence in areas, such as operational troubleshooting, crude selection, refinery planning, profit margin analysis, turnaround planning and more. To embark on this journey, refiners need to unlock critical clues to profitability.

for process simulation and rigorous heat exchanger modeling, a seamless integration between the process simulator, heat exchanger design and rating tools is required. Process engineers can now effortlessly develop and integrate rigorous simulation of heat exchanger operation, as part of the refinery flowsheet. HPCL's refinery in Mumbai, India, has saved time and money (over \$250K annually), while improving their heat exchanger maintenance schedule. The INEOS refinery in Lavera, France, saved \$4 million annually by employing a heat exchanger fouling monitoring application.

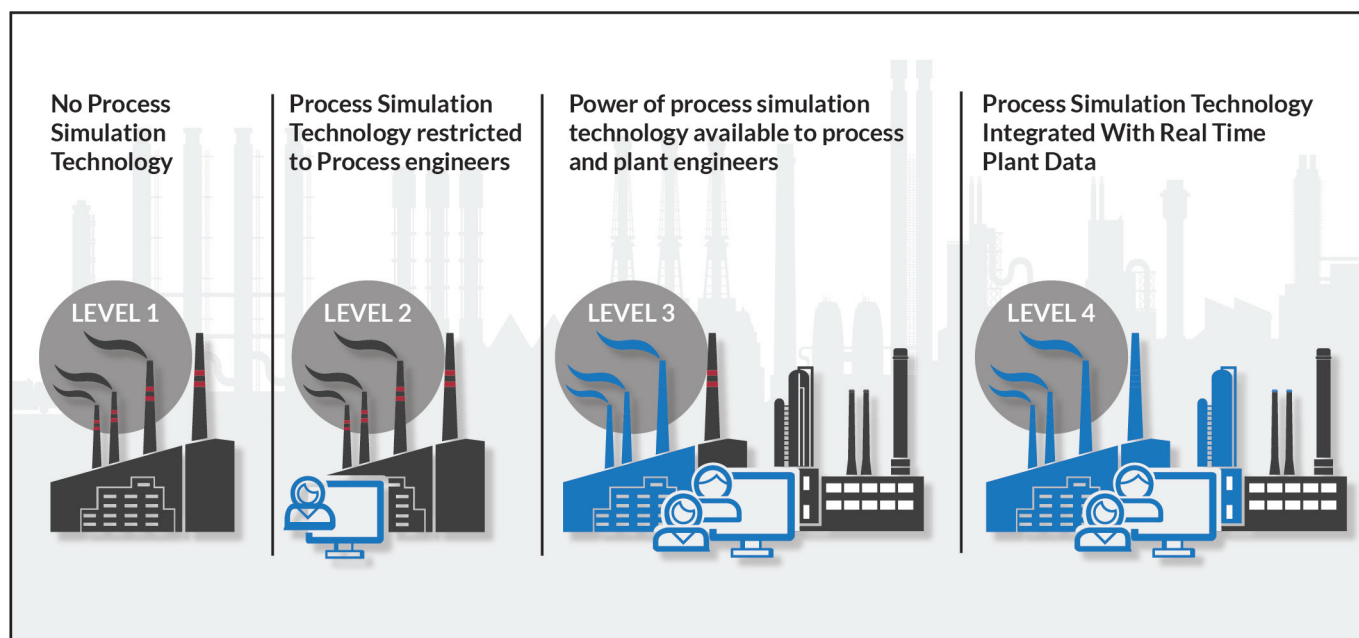


Figure: Refineries need to be mindful in considering the level of maturity at their companies

First clue: Heat Exchanger Maintenance and Monitoring

Heat exchangers are crucial to determining energy efficiency levels. Refiners need to know when is the best time to take them out for maintenance and minimize the impact on profitability. Separately, the rigorous simulation of the heat exchanger unit operations helps determine the level of fouling in each unit and its resulting economic impact.

This helps refineries set up prioritized maintenance schedule for their heat exchanger networks. To overcome the challenge of using disparate tools

Second clue: Column Operations Troubleshooting

With advanced process simulation software, users can accurately simulate the thermo-hydraulic functioning of columns based on their construction and operating conditions. This helps them better understand the behavior of columns and avoid operational mishaps. By simulating the operation of the column unit within the broader setting of the overall process, users can identify the root causes of their column problems and figure out the optimal point of operation for the overall process unit. In addition, visualization tools provide insight into the operating point of the column and highlight any impending breach of operational limits,

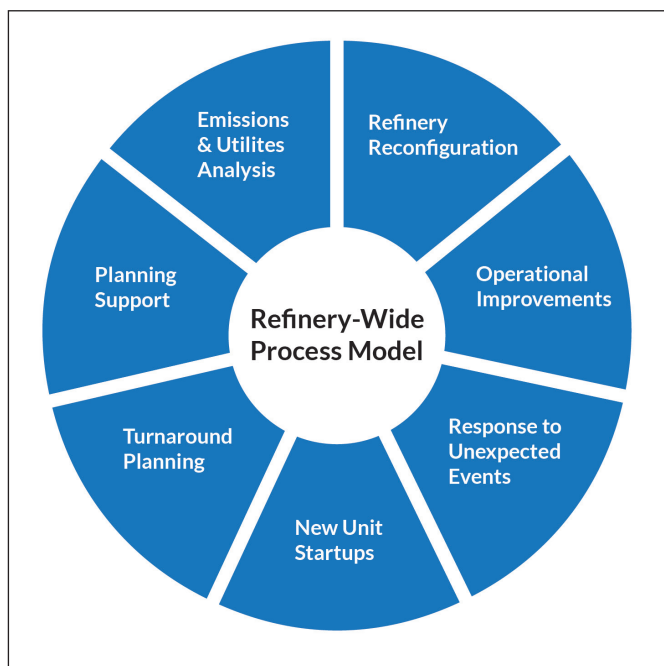


Figure: To embark on this journey to maximize profits, refineries need to unlock critical clues to profitability.

which causes issues – such as jet flooding, weeping, down-comer backup and others. This allows refineries to build a work culture of continual process optimization and preventive maintenance by taking advantage of advanced process simulation technology.

Third clue: Integrated Refining and Gas Plant Analysis

In using integrated solutions, engineers can create a rigorous simulation of refining and gas plant operations within a single simulation environment. This allows refinery operators to assess, if they can accommodate increased levels of sour crudes in their refineries.

It also allows them to preemptively adjust operations in the gas plants and suit new crude processing. By enabling feed flexibility, capacity creep and OPEX optimization via integrated refining and gas plant process simulation, refiners save millions of dollars each year in operating margins. They are also ensured of maximum reliability and plant on-stream time. The rigorous simulation of gas plant operations offers refineries the visibility and ability to better document their emission levels.

Fourth clue: Planning Model Update

To manage their operations, refineries use planning tools to make better informed decisions. While traditional linear programming (LP) models are employed by these planning tools to find the most optimal plan, they are only accurate within a specific operating range of the refinery. Overtime, refineries move away from the operating range – for example, it can happen due to catalyst deactivation or other operational changes. This means that LP models become outdated, which reduces the effectiveness of the planning tools, which adds up to millions of dollars in lost profits. The solution is to maintain the planning models, with the help of advanced process simulation software. This enables updates when the models are out of sync with the operating range of the refinery. Process simulation software is key to this solution, providing the predictive capability that comes with rigorous process analysis based on reaction kinetics, heat and mass balance. Today, leading solution providers have built-in integration between process simulation and refinery planning to streamline the workflow of updating planning models. With these advanced tools, refiners can now follow the workflow without depending on external consultants. Taiyo Oil in Japan has reported a 12.7% increase in their refineries' profit from maintaining their refinery planning and scheduling tools using advanced process simulation solutions. This capability puts in place a culture of true partnership between planners and process engineers in maintaining planning and scheduling tools to maximize and sustain refinery profits.

Fifth clue: Refinery Wide Process Analysis – The Pinnacle of Technological Maturity

Refineries can develop a refinery-wide process model from their refinery-wide planning model relatively quickly with an advanced integrated solution for process simulation and refinery planning. The accuracy of the simulation model is enhanced by selectively incorporating rigorous models of reactor units to the refinery-wide flowsheet. With this methodology, users can have full control over the rigor and flexibility of the model. With this solution, refineries can use the model to accurately assess the economic impact of possible strategic reconfiguration projects. It also supports planners dealing with special cases that require a more accurate profit assessment versus what is projected by their LP tools. The model can

“By choosing a technology partner with the ability to present a comprehensive end-to-end solution platform, refineries can achieve world-class operational efficiency without depending on expensive consultants.”

FEATURES



Figure: By systematically unlocking clues to increased profitability, Sherlock Holmes is literally left behind in this industrial game of Cluedo.

be used for rigorous profit-margin analysis when evaluating strategic reconfiguration options or operational improvements to the refinery. This becomes a handy tool in evaluating responses to unexpected operational events, as well as to determine turnaround and startup plans.

Beating Sherlock Holmes at his own game

Refineries need to be mindful in considering the level of maturity at their companies. Maturity levels range from zero to full maturity. At zero maturity, a refinery does not have the culture of using process simulation technology to support their operations. At full maturity, refineries employ refinery-wide process simulation models in a single flowsheet, which enables process engineers to support the refinery in strategic and operational decision making.

An inevitable element of this journey is for employees to be skilled in the latest technology and kept updated of industry best practices. By choosing a technology partner with the ability to present a comprehensive end-to-end solution platform, refineries can achieve world-class operational efficiency without depending on expensive

consultants. With these tools, refinery process engineers can develop their skill sets and process knowledge to become world-class engineers. Indeed, by systematically unlocking clues to increased profitability, Sherlock Holmes is literally left behind in this industrial game of Cluedo. ●



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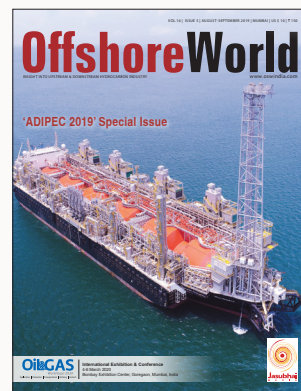
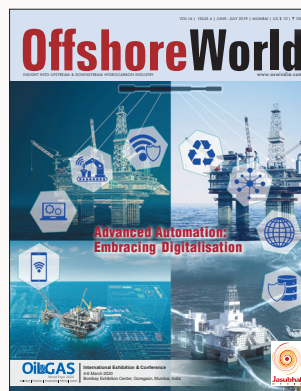
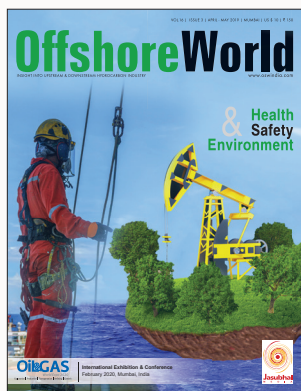
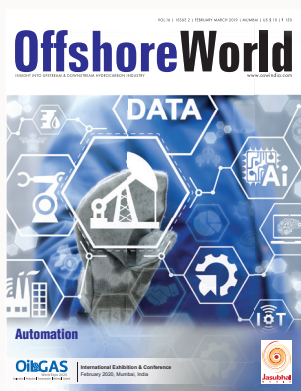
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Embracing Digital: Realizing Unfulfilled Potential in Oil and Gas Industry

Not long ago, the crucial rule of the game was focused on large production. The rules then shifted - to better margins because of a significant imbalance in demand and supply, geo-political decisions, and low crude prices. In the current economy, efficiencies in operations is the name of the game and the industry seems to have fixed their eyes on one major frontier: digitization

Digitization, which can be described as collecting, monitoring, and analyzing huge amount of data, can bring a dawn of new operational efficiencies using sensors, increased computational power, automation, remote configuration and optimization, control systems, and even artificial intelligence. Analyzing big data is not new for an industry that has relied on data for decades to understand the potential of reservoirs that hold billions and trillions cubic feet of oil and gas. Yet the industry, particularly upstream, has been struggling to become "more digital." Many companies are now giving their digital strategies a new lease of life to curb the menace of a rather painful downturn and position themselves for next growth cycle.

Although the potential benefits of automation in the entire upstream value chain is evident, some of the biggest and impactful opportunities exist in production operations. With oil and gas companies looking to deeper seas for resources, any downtime will become costlier than it was at any time before. Automation may create several benefits for operator to that end: asset utilization and integrity and increased field recovery. There is another opportunity lying ahead, not just for oil and gas producers, but also for drilling operators and oilfield services companies.

Digital approach of major upstream stakeholders

Exploration and Production companies

Smart Exploration

Digitization is not just about much needed efficiencies; it is also about enabling E&P companies to develop powerful capabilities to benefit

from smarter exploration, easy capturing of data, robust reservoir modelling applications, safer operations, and interoperability of data across exploration activities. This helps not only in reducing costs and better utilization of labor, but also, if done well, in transforming the planning process with predictive analytics. This provides E&P companies with a better shot at anticipating and responding to ever-changing market scenarios.

Payment Process

An often neglected area for exploration and production companies is the ability to speed up the ever daunting and slow process of payments in this industry. Some E&P companies are trying auto-executable contracts and quick payments transfer by using blockchain technology that removes the requirement of a mediator to validate transactions. By accelerating the industry's slow payments process, technology can free up cash for exploration, lower a company's operating expenses, and contribute to higher margins per barrel.

Drilling Contractors

Asset Strategy

Since the downturn, many drilling operators had either cancelled new orders or refurbished their old rigs to continue working with aging assets. Many companies may have to reassess their portfolios, and make sure that they capable of supporting increased activity and new drilling environments. Most will need to redefine their fleets to match those opportunities—and likely will have to expedite retirement of some older rigs. Operators and drillers should collaborate in developing scenarios for balancing the supply and demand of rigs over the long term to reduce the risk of fleet investments.

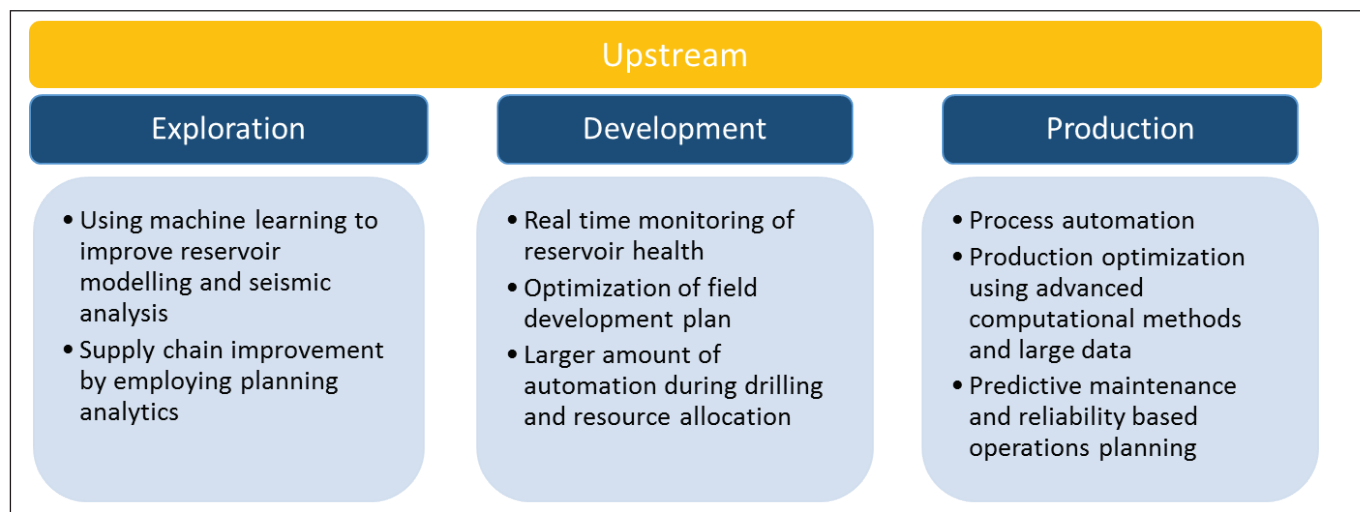


Figure 1 : Impact of digitization on Upstream Value chain

Technology

All three upstream stakeholders, operators, drilling contractors, and oilfield services providers have to work together to transform the entire end-to-end technology solution by introducing more automated drilling, data-centric approach, and condition-based maintenance. This requires acceptance from all the stakeholders about challenges and opportunities new technology brings to the sector.

Oilfield Services

Connected Oilfield

The connected oilfield is about an integrated approach towards operations: using IT to change processes for better decision making, remotely access, monitor and control equipment, and to move more functions and personnel onshore. This approach ensures that not only risks associated with business, health, safety, and environment are reduced but also the objectives of going digital are achieved. A connected oilfield works on a virtual environment where effective communication and collaboration among experts can occur, regardless of where the experts are physically located or to which organizations they belong. For example, a basic ability to remotely recalibrate a pressure gauge makes sure that relevant data can be shared and incorporated in the decision-making process quickly, avoiding delays and saving safety risk, time, and money. A lot of visualization tools are being developed that will aid in ensuring seamless integration of data, thus making interpretation of data easier and availability of data transparent.

Use of Virtual Assistants

With the advent of chatbots, it is not difficult to imagine that a virtual

assistant can provide a technician clear instructions in the field when a safety valve stops functioning. The idea of virtual assistant may seem futuristic, but already a major oilfield services company is trying an AI based virtual assistant providing assistance to its field engineers for its logging operations.

Key themes of digitization across oil and gas Industry

Predictive Analytics and Asset Management

Asset management has been a much talked about topic in the industry, but it is only now that oil and gas companies are warming up to utilize its full potential. Coupling asset management with predictive analytics has ushered in a new age of out of the box solution to reduce costs of operating an asset. Asset maintenance, in many industries, is moving from a time bound inspection towards a risk based assessment of assets. This ensures minimum downtime and reduced costs and occurrences of emergency repairs.

Artificial Reality and Wearables

Many technology commentators have already written a lot about applications of artificial reality / virtual reality in our daily lives. Imagine this: a field engineer is wearing a smart glass that shows him 3D schematics, guidelines, and video instructions to repair a critical failure in an offshore gas turbine that powers the operations of a huge process platform. Or a wearable that guides you to the nearest evacuation points in case of emergency. This kind of over-the-shoulder coaching will not only reduce downtimes drastically, it will also reduce HSE risks and expedite on-the-job training for new employees.

FEATURES

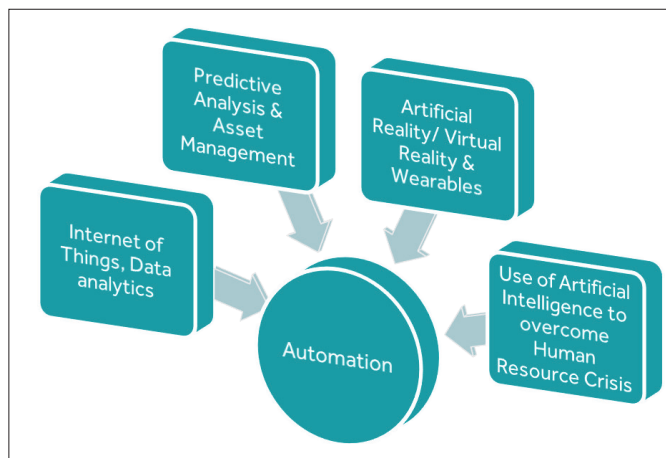


Figure 2 : Oil and Gas Industry is slowly bracing automation

Internet of Things, Data analytics, and Process Efficiencies

Big data has been talk of the town for the past five years, and rightly so. Rich data that had been lying unused for decades suddenly became useful and helped companies in shaping their strategies to iron out efficiencies in their operations. All this has been possible by ensuring that companies collect right data using sensors that feed continuous data to the cloud. As we look to expand scope and applications of Internet of Things, oil and gas companies are finding newer ways to collect more data and devise strategies to improve efficiencies further. It is an unavoidable truth that many oil and gas companies either have made a new CXO position of Chief Data Officer or are in the process of hiring one.

Overcoming Human Resource Crisis using Artificial Intelligence and Machine Learning

Oil and gas industry is undergoing one of the biggest “forced” transformations at this time: Human Capital management. There is widespread unknown of losing many experienced professionals, as many tenured employees are going to retire in next 3-4 years or have switched to other professions to weather the downturn. Many players across the industry are trying to digitize the knowledge and experience these professionals possess. As the age of AI and high computational power dawns on us, we can use these tools to create an intelligent database of all these experiences. A database that not only grows, but also learns.

Strategy to Plan for the Digital Future

- **Identify key areas of value chain** that has the highest impact on financial and operating parameters, and treat them as opportunities to improve delivery through digital approach.

- **Look for significant trends** that dominate the industry with focus on identified areas of the value chain, and take a decision to either innovate or adopt tested technologies and processes.
- **Define the links** between a company’s most critical decisions and digital applications, and show how these applications improve efficiencies of existing processes.
- Most companies falter by considering digital strategies as a one-time approach. **Evaluate the investment** to digitize identified processes and activities and support with a multi-year budget and roadmap.
- Accept and **assess the gap between current personnel capabilities** and capabilities required to implement new technologies, and plan an upgrade of existing talent or leverage a partner.

Way Forward

The journeys of this digital transformation will not always be rosy, and they will differ depending on maturity on the digital ladder, ambitions, and financial provisions. Digital leadership is not always the best strategy, and it can be expensive. Although at a time when companies are reducing their capex extensively year on year, this strategy might look odd. However, with the ever-decreasing cost of digital transformation, rapidly improving tools, and potential reduction in operating costs, this area should have enough bandwidth in terms of focus and budget. It is no coincidence that all the major themes on digital transformation lead on to some degree of automation, and it is anybody’s guess that the industry is indeed headed towards automation. While en route on this digital transformation, it should not be forgotten that any strategy should aim to create a competitive advantage over the next three to five years. All of these propositions should include initiatives that offer short-term gains and ensure that the companies develop long-term competitive advantage to reap the benefits of digitization. ●



Divjot Singh

Business Development Manager
Energy and Natural Resources
Cyient

Roediger Vacuum Sewer System

Roediger vacuum systems are a cost-effective alternative to gravity sewer systems. Vacuum systems are particularly attractive in environmentally-sensitive areas and when difficult sub-surface conditions exist such as high groundwater table, unstable soils, rock and restricted construction conditions.

Toshniwal's systems and applications offer wide range of solutions for your specific wastewater problems:

- Vacuum sewers: sewers, sewer rehabilitation, septic tank replacement, marinas;
- Vacuum sanitation: buildings, industrial applications, mobile sanitary units, ships;
- Supply and disposal systems: airports, hospitals, railway depots;
- Services for wastewater treatment plants: digestion, sewage gas, waste disposal sites.

Toshniwal uses vacuum technology for the collection of wastewater in sewers, sanitation systems or industrial supply and disposal systems. In addition, Toshniwal offer solutions for marinas, buildings and ships as well as for airports, railway depots and hospitals. Toshniwal help you change your wastewater management from disposal towards reuse by innovative system solutions, which allow you to efficiently use and recover resources such as water, energy and nutrients.

Vacuum sewers offer the following advantages:

- Cost savings due to smaller pipes, shallower and narrower trenches, less dewatering and significantly less surface restoration all done with smaller equipment;



- Only one source of power is required at the vacuum station, a standby generator at the vacuum station provides uninterrupted service during power outages, no power is required at the house/valve pit;
- Operator-friendly as the operator never comes in contact with raw sewage, confined spaces are not an issue;
- Environmentally-friendly as the system is entirely closed which not only prevents leakage but also infiltration and inflow, this also results in a reduced load on the treatment plant;
- Multiple lift stations can be replaced as it is not uncommon for one vacuum station to replace 6-8 gravity lift stations; and
- Cost overruns avoided due to vacuum's vertical and horizontal routing flexibility, which allows unforeseen underground utility conflicts to easily be avoided.

Overwater Bungalows at Disney in Orlando, FL

Noted as Disney's highest end vacation rentals, 20 bungalows were to be developed on a pier structure over water.

Challenge

In addition to collecting the wastewater from each bungalow, drain water from twenty 1,000 gallon plunge pools were to be collected too. The challenge was to design a wastewater collection system, where the piping could be securely fastened to the pier and buried on land, while maintaining a visually pleasing appearance.

Solution

The vacuum sanitation system provided the most economical, ecological and effective solution. The wastewater from each bungalow and plunge pool collects in a dual 25 gallon collection sump that is installed beneath each bungalow. The normally closed 3" vacuum interface valves were installed in a maintenance closet, allowing easy and safe access. These vacuum interface valves are completely pneumatic. Therefore, no additional power was required at each bungalow. Installing the collection sumps beneath the bungalows and anchoring the small diameter piping tightly to the pier, provided the visually pleasing appearance the client required.

Vacuum Station

Vacuum station has

- 1,000 gallon collection tank;
- Two 200-CFM oil-less and internal coated vacuum pump; and
- Two 150-GPM discharge pumps.

Collection Chambers

Collection chambers has

- Twenty dual 25-gallon collection sumps and
- Forty 3-inch vacuum interface valves. •

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The Economic Value of Steam Flow Measurement

Last month we considered the economic value of steam flow measurements. Liquid flows are typically more common, so let us take a look at an example of their economic impact here.

Assuming the average liquid flowrate is one kg/min valued at ₹ 20.00 per liter operating whole year round, the flowmeter would pass approximately

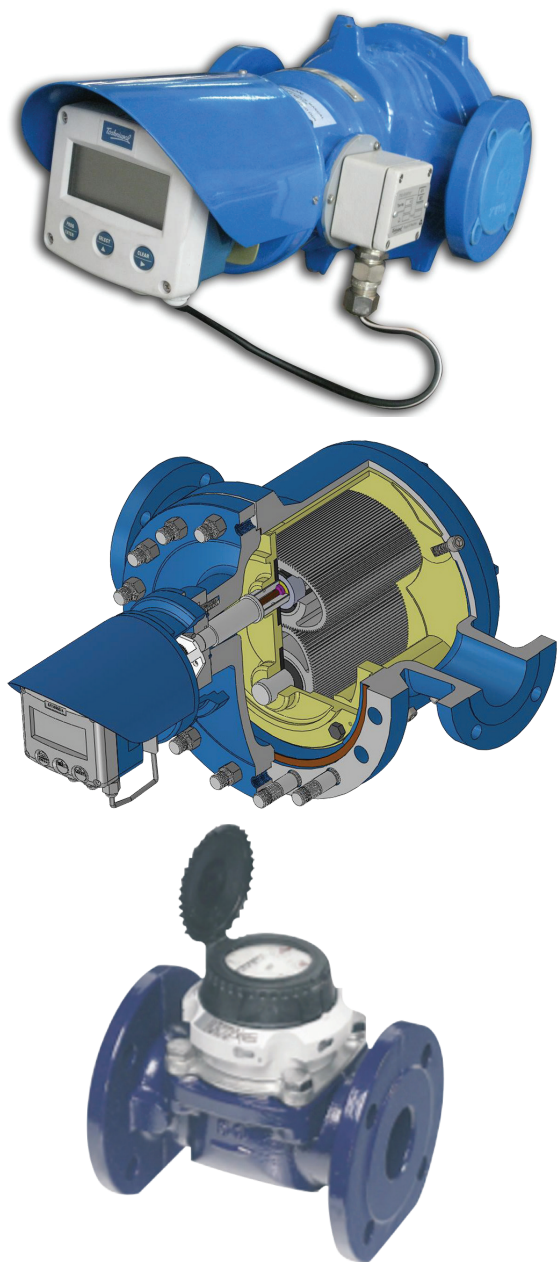
₹ 1,75,200 of liquid per year (1 liter/min * 60 min/hr * 8,760 hrs/yr * ₹ 20.00 per liter).

Think about this for a minute... a small flow of reasonably priced liquid results in over ₹ 200,000 of liquid passing through the flowmeter each year. In custody-transfer applications, purchasing a flowmeter that performs 1 per cent better can reduce the measurement error by ₹ 2,000 per year. This value is much larger in many custody-transfer applications, so reducing the magnitude of flow measurement error can be used to justify better (and more costly) flow measurement devices.

While justification for improved (and more costly) flow measurement devices is relatively easy in custody-transfer applications, how many times have you had to fight (tooth and nail) to purchase a more expensive flowmeter for process applications? Did you ever calculate the value of the material passing through the flowmeter? You might be surprised with the results.

For example, a flowmeter operating year round at 100 liters per minute will pass over \$25-million of liquid per year if the liquid is valued at ₹ 40 per liter. This may not be economically important in many process applications, such as recycle, cooling or spray flows where the flow need only be higher than a minimum value. However, it can be of extreme importance in other process applications, such as reactor feeds, where addition of the proper amount of reactants can drastically affect chemical reactions, process yield, and the economics of the operation.

The majority of process flow measurements typically fall between these two extremes and can exhibit a detrimental effect on process economics. For example, the flowmeter detailed here might be the slave process variable in a cascade level control. There could be a discussion (fight) as to whether to buy a flowmeter for \$2,700 or a superior flowmeter for \$3,300. Put in another perspective - should one spend an additional \$600 to better measure \$25-million of liquid per year? You decide... •



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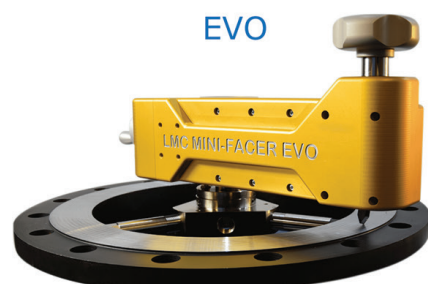
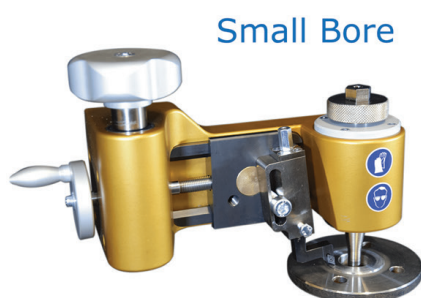
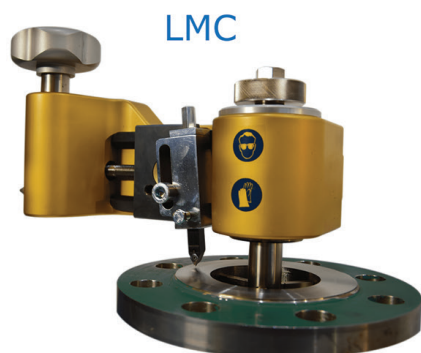
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Flange Facing Made Easy!



Founded in 1996, Lenmatec utilises its knowledge and hands-on experience to offer an array of high-end and specialised products. Mainly active in the domain of on-site solutions, we focus on problem-solving products for on-site services. Here at Lenmatec Group, we aim to achieve innovative engineering, solutions, increase reliability, efficiency and sustainability for the benefit of the customers.

One of the many products in our portfolio is the MiniFacer line of tools. The MiniFacer product ranges are all manually-operated flange facers for easy and quick re-machining damaged flange faces. The idea of this machine originated from an authentic manual coffee grinder way back in 2008. Not much later, that idea becomes a reality today in 2020, a product range of not less than four manual machines.

These easy to operate hand-held flange facers allow any technician to recondition RF/FF and other gasket seating in-situ. There are four fundamental aspects to the philosophy underpinning these machines: simplicity, efficiency, durability and safety.

The whole range of MiniFacers can be set up easily in minutes, and machining to recondition a flange surface can be done in seconds. The result is seamless every time and all in accordance with the norms for a correct gasket surface finish (ASME B16.5). Therefore, the slogan, Flange Facing Made Easy, comes true.

Flanges are widely used within all kinds of industries. All MiniFacers can be used in various industries such as energy, chemical, petrochemical and mining industries, as well as, in power plants, pharmaceutical and refineries. These manual flange facers have an operational range up to 24" ensuring a solution for every problem. The compact form and lightweight of the MiniFacers also allows them to be used for flanges in confined spaces or small access situation, as well as, flanges on a high column or in the installation of elevated parts of factory facilities •

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Rising Demand of Oil

As per World Energy Outlook 2019 published by International Energy Agency, India's oil demand in total primary energy is projected to increase from 233 Million tonne of oil equivalent (Mtoe) in 2018 to 305 Mtoe in 2025, whereas China's oil demand is projected to increase from 593 Mtoe in 2018 to 672 Mtoe in 2025.

Government has taken several steps to enhance exploration & production of oil and gas, give thrust on demand substitution, promote energy efficiency and conservation, capitalize untapped potential on biofuels and alternative fuels/renewables in order to reduce imports of crude oil. These include a series of initiatives such as Policy for Relaxations, Extensions and Clarifications under Production Sharing Contract (PSC) regime for early monetization of hydrocarbon discoveries, Discovered Small Field Policy, Hydrocarbon Exploration and Licensing Policy, Policy for early monetization of Coal Bed Methane, Setting up of National Data Repository, Appraisal of Unappraised areas in Sedimentary Basins, Re-assessment of Hydrocarbon Resources, Policy framework to streamline the working of Production Sharing Contracts in Pre-NELP and NELP Blocks, Policy to Promote and Incentivize Enhanced Recovery Methods for Oil and Gas, Policy framework for exploration and exploitation of Unconventional Hydrocarbons under existing Production Sharing Contracts, Coal Bed Methane contracts and Nomination fields.

The Government in February, 2019 approved major reforms in exploration and licensing policy to enhance exploration activities, attract domestic and foreign investment and accelerate domestic production of oil and gas from existing fields. The policy reforms inter alia aims to boost exploration activities with greater weightage to work programme, simplified fiscal and contractual terms, bidding of exploration blocks under Category II and III sedimentary basins without any production or revenue sharing to Government, early monetization of discoveries by extending fiscal incentives, incentivizing gas production including marketing and pricing freedom, induction of latest technology and capital, more functional freedom to National Oil Companies for collaboration and private sector participation for production enhancement methods in nomination fields, streamlining approval processes and promoting ease of doing business including electronic single window mechanism.

Indian Strategic Petroleum Reserve Limited (ISPRL) has already created SPR facilities at 3 locations, namely (i) Vishakhapatnam (1.33 MMT), (ii) Mangaluru (1.5 MMT) and (iii) Padur (2.5 MMT). Government has given 'in principle' approval for creation of two additional underground rock cavern SPR facilities with total storage capacity of 6.5 Million Metric Tonne (MMT).

Government is promoting the usage of environment friendly transportation fuel, i.e. CNG by expanding the coverage of City Gas Distribution (CGD) network in the country. Government has also taken a

number of initiatives to encourage the use of alternative fuels like ethanol and bio-diesel through Ethanol Blending in Petrol (EBP) Programme and Bio-diesel blending in diesel. Government has formulated a National Bio Fuel Policy 2018 to boost availability of biofuels in country.

New Technology & Business Models to Drive the Future of India's Energy Sector

Minister of Petroleum & Natural Gas and Steel Mr. Dharmendra Pradhan has said that future of India's energy sector will be noticeably different from its current avatar, to be driven by new technology and business models. He stressed on the need to achieve the twin objectives of more energy availability at an affordable



Mr. Dharmendra Pradhan, Minister MoPNG & Steel, Govt. of India

price and less carbon through a healthy mix of all commercially-viable energy sources. He said that our target to transform India to a USD 5 trillion economy by 2024, requires a gradual and measured energy transition by deploying all sources of energy.

Mr. Pradhan said that the contours of India's energy transition are also changing fast in sync with global challenges and opportunities. "Winds of change are evident in the global energy arena. Energy sources, energy supply and energy consumption patterns are changing rapidly. In our pursuit to navigate energy transition, it is natural that we will take advantage of unique synergies that exist within the country. Equally, our efforts will be guided by our global commitments be it under UN Sustainable Development Goals (SDGs) of 2030 or those under Paris Climate Summit.", he said. The government's approach to energy policy is based on energy access, energy sustainability, energy affordability, energy efficiency and energy security. All these five enablers will deliver energy justice to our people.

The Minister advocated the need to move away from the crude price as the basis for determining the LNG price. He said "Global gas production and markets have witnessed significant restructuring during the last few years. Global supply of LNG is increasing at a rapid pace, and globally LNG prices are coming down significantly. It is time for our companies to take a relook at the term-contracts with major LNG suppliers. I also believe that the time has come for changing the pricing formulae for purchase of LNG by India." Mr. Pradhan stressed on building sustainable energy infrastructure that can cater to the energy needs of all our citizens. He said that India is expected to become the largest energy consumer surpassing US and China, in the next decade or so.

Mr. Manoj Jain Takes Charge as Chairman & Managing Director, GAIL

Mr. Manoj Jain has assumed charge as Chairman & Managing Director of GAIL (India) Limited. A Mechanical Engineer with an MBA in Operations Management, Shri Jain joined GAIL as a Graduate Engineer Trainee in 1985 and rose through the ranks to his current position. Before his appointment as CMD, Shri Jain was Director (Business Development) of the company. He possesses rich and diverse experience in the areas of Business Development, Projects, O&M, Petrochemicals, Pipeline Integrity Management and Gas Marketing which has allowed him to gain insight and knowledge across multiple business units and functional areas.



As Director (Business Development), he was responsible for building GAIL's business portfolio in India and abroad, Merger and Acquisition, Petrochemical O&M and Expansion, Exploration & Production, R&D, Start-Up, Health Safety & Environment management, Quality Management, Project Development including feasibility study and investment approval for new pipelines, process plants, renewables, etc.

He is also currently Chairman of GAIL Global (USA) Inc. (GGUI), GAIL Global (USA) LNG LLC (GGULL) and Konkan LNG Pvt. Ltd (KLPL).

Earlier, he looked after Gas Marketing activities in his role as Executive Director (Marketing-Gas). Shri Jain also spearheaded the installation and commissioning of the mega-grassroots Petrochemical complex at Lepetkata, Assam, as Chief Operating Officer of Brahmaputra Cracker and Polymer Ltd. (BCPL).

Shri Jain had worked in Operation & Maintenance of Natural Gas pipelines and played a significant role in establishing the National Gas Management Centre (NGMC) and systems and procedures for transmission and marketing of comingled gases.

Sandvik Adds New Tube Line at Indian Steel Mill to Boost Capacity and Local Service

Sandvik, a developer and producer of advanced stainless steels, special alloys, titanium and other high-performance materials, adds a new cold finishing tube manufacturing line at its Mehsana Mill, in Gujarat, western India.

Sandvik Mehsana is a high-tech tube mill that produces advanced corrosion-resistant tube, pipe and hollows for heat exchangers and process equipment across a wide range of industries, including petrochemical, oil and gas, chemical and fertilizer. With the addition of this new high-tech

line, Sandvik aims to increase the availability of its high-quality seamless stainless tube, add flexibility for introducing new grades and strengthen regional service. The new line is mainly aimed at the production of heat exchanger tubing and for other demanding industrial applications, and will double Mehsana's cold-working capacity and thus allowing swifter delivery times across the Asia Pacific (APAC) region. The cold forming process, which involves drawing and shaping of the tube, is used to impart higher strength than found in the initial annealed condition.

To achieve the highest straightness, low eccentricity and tight dimensional tolerances, Sandvik employs its own patented cold pilgering technique. The new cold finishing line will focus on heat exchanger tube sizes in austenitic, duplex and nickel-based alloys, which can be supplied straight or U-bent for shell-and-tube heat exchangers – cleaned and plugged. "We're delighted to announce the added annual capacity for cold finished tube," says Mr. Sharath Satish, President for Business Unit Tube APAC, Sandvik. "It's part of our ongoing commitment to customers in India and the Asia Pacific region to improve the availability of our top-quality products, broaden the portfolio and become the most reliable, onestop-shop in the region. Together with fabricators and end users, we are expanding new opportunities to boost productivity and extend the lifecycle of their equipment with the help of predictable, high-precision tubing – delivered when they need it." The Mehsana manufacturing facility has been successively expanded and modernised in recent years. The focus has been on boosting capacity, adding new grades and sizes, and constantly improving to meet the highest global quality standards. "Mehsana is a key pillar in our strategy of being a reliable global supplier of advanced corrosion resistant alloy products, with a focus on materials expertise, innovation and setting the standard in our niches," said Michael Andersson, Head of Tube Division at Sandvik Materials Technology. Sandvik maintains a highly integrated and sustainable manufacturing process, with tube products made from 84 percent recycled metal using efficient manufacturing processes. Driven by a "zero defects" philosophy and ambitious targets, the mill secures full traceability from melt to final tube. This means that individual heat exchanger tubes can be traced in every step of the production process back to the individual melt, heat and lot. Every tube undergoes a battery of chemical and mechanical tests, including positive material identification (PMI), so customers always know the material is what they ordered. Developed and manufactured in the new facility, customers can anticipate all-new superaustenitic grades that will in many cases bridge the properties gap, at higher temperatures, between standard duplex/austenitic grades and more costly nickel alloys. "Many customers know about our austenitic and duplex programs but are surprised to learn that we have a growing range of nickel alloy grades," says Mr. Nitin Chaudhari, Production Unit Manager of PU Mehsana. Many of these products fall under Sanicro brand, such as Sanicro 30 (Alloy 800), Sanicro 41 (Alloy 825), Sanicro 70 (Alloy 600) and Sanicro 625 (Alloy 625), to name a few. All these alloys will be manufactured in the company's new facility increasing the range and local service for the customers.

IOCL Signs First Term Contract for Importing Russian Crude Oil to India



The Minister of Petroleum & Natural Gas and Steel, Shri Dharmendra Pradhan and Mr Igor Sechin, CEO and Chairman of Rosneft, held the bilateral meeting here today. Both leaders also witnessed the signing of the first-ever Term Contract between IOCL and Rosneft for importing 2 Million Metric Tonnes of Urals grade crude oil during the year 2020 to India. Sourcing of Russian crude oil through long term contracts is a part of India's strategy for diversifying the country's crude oil supplies from non-OPEC countries, and a part of the five-year roadmap for bilateral cooperation in the hydrocarbons sector that was signed during Hon'ble Prime Minister Shri Narendra Modi's visit to Vladivostok last September.

The addition of Russia as a new source for crude oil imports by India's largest refiner will go a long way in mitigating the risks arising out of geo-political disruptions. The new arrangement would also usher in price stability and energy security for India, which is witnessing robust growth in demand for petroleum products. It will also open up the avenues for other PSU oil refiners to enter into similar term contracts for import of Russian crude oil.

Both sides agreed to take forward mutually aligned priorities, including preparing a roadmap for Indian investments in the Eastern Cluster projects of Russia. It was noted that the four Indian oil and gas Public Sector Undertakings (PSUs) have already submitted the Expression of Interest to Rosneft to participate in the project. In order to negotiate the terms of Indian companies entering Vostok Oil in the shortest time possible, it was agreed to create a working group of representatives of Russian and Indian companies.

During the meeting, both leaders reviewed the ongoing investments between Indian oil & gas PSUs and Rosneft, and discussed further enhancing energy cooperation and strengthening hydrocarbons engagement, both on investment front as well as sourcing natural gas and crude oil. During the meeting, Shri Pradhan said that Hydrocarbon is an important pillar of the bilateral Strategic Partnership. "Indian oil and gas companies value their association with Rosneft, one of the important companies partnering in India's energy security objectives." Both sides agreed to take forward mutually aligned priorities discussed during Shri Pradhan's visit to Russia in September last year, including preparing a road-map for Indian investments in the Eastern Cluster projects of Russia specially in the Arctic. Shri Pradhan said that Indian companies especially Engineers India Limited have considerable expertise in providing engineering consultancy as well as executing mega projects across the hydrocarbon value chain. Mr. Sechin

indicated his readiness to intensify cooperation further to strengthen India's energy security and work jointly with Indian oil and gas companies. The crude oil, being sourced under the contract, will be loaded in Suezmax vessels at Novorossiysk port of Russia and will come to India, bypassing Straits of Hormuz.

Indian Oil Signs MoU with National Petroleum Authority of Ghana

In a step that will further strengthen the relations between India and Ghana, Indian Oil has signed a MoU with the National Petroleum Authority (NPA) of Ghana for providing its assistance and technical expertise in the implementation of Ghana's National LPG Promotion Policy. With India's emergence as a world leader in provision of clean energy to its citizens by the expansion of its LPG network, Ghana sought assistance from India in its own efforts to promote to safe, clean and environmentally friendly LPG for increased domestic, commercial and industrial usage.

The MoU was exchanged between NPA of Ghana and Indian Oil in the august presence of Minister of Petroleum and Natural Gas & Steel Mr. Dharmendra Pradhan, and H.E Mr. Michael Aaron, High Commissioner of Ghana at New Delhi. Mr Alhassan SulemanaTampuli, Chief Executive, NPA, Ghana and Mr. L.K.S Chauhan, Chief General Manager (LPG Operations), Indian Oil signed the MoU to strengthen cooperation between the Parties in the field of Petroleum in particular LPG by which Indian Oil would support the NPA on the successful implementation of the Re-circulation Model (CRM) of LPG.

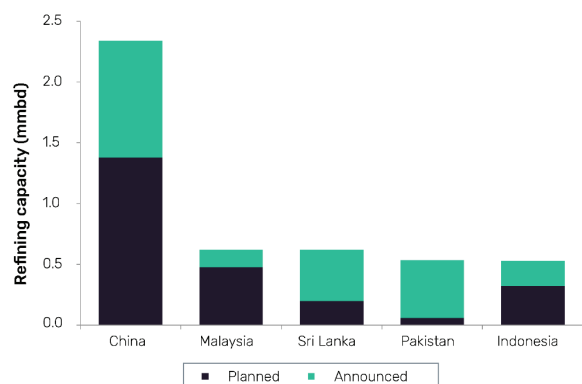
In this regard, Indian Oil, the country's flagship oil marketing company would on behalf of India provide support to the National Petroleum Authority of Ghana in several areas such as development of Health, Safety, Security and Environment (HSSE) Standards, development of Licensing, permit and legal framework, development of economics for LPG bottling plant, pricing structure, and communication strategy. Indian Oil will also assist in areas of infrastructure development for the new LPG Value chain, support for upgrading capacities of institutions along with policy development and review. The MoU also provides for administrative assistance to Indian Oil in case it decides to participate as a commercial participant in Ghana's downstream petroleum sector.

Cabinet Approves MoU Between India and Brazil

The Union Cabinet, chaired by the Prime Minister Mr. Narendra Modi, has given its approval for the signing of the Memorandum of Understanding (MoU) between Republic of India and Federative Republic of Brazil on cooperation in the field of oil and natural gas. The MoU will enhance cooperation between the two sides in oil and natural gas sector. Under the MoU, both sides will work towards establishing cooperation in the E&P initiatives in Brazil and India, research & development in this sector, explore collaboration in Liquefied Natural Gas projects in Brazil, India and third countries, and also encourage collaboration in oil energy and environmental issues, including energy policies such as energy efficiency, energy research development and expansion of the regional energy infrastructure networks.

China Set to Dominate Asian Refining Industry

New-build Refining Capacity Additions in Asia by Key Countries, 2020–2024



mmbd – million barrels of oil per day

Source: GlobalData, Oil and Gas Intelligence Center

China is expected to lead the Asian refining industry by contributing about 44% of refining capacity additions from planned and announced (new-build) projects by 2024 according to recent 'Global Refining Industry Outlook to 2024' by Global Data, a leading data and analytics company. The report reveals that China is expected to add 2.3 million barrels per day (mmbd) of planned and announced crude oil refining capacity by 2024. Out of this, 1.3 mmbd comes from the planned projects, while the rest of 1 mmbd is from the announced projects. Report states in China, a total of 9 upcoming refineries are expected to start operations between 2020 and 2024. Among these, five are planned refineries and four are announced refineries. The Jieyang refinery will be the major upcoming refinery in China with refining capacity of 400 mbd. It is expected to start operations in 2021. Global Data expects Malaysia and Sri Lanka to jointly be the second largest countries in Asia in terms of planned and announced refining capacity additions. Both the countries are expected to add 620 thousand barrels per day (mbd) of refining capacity each by 2024. The Hambantota III refinery is the largest upcoming refinery in Sri Lanka with the refining capacity of 420 mbd in 2024, while the Pengerang I refinery is one of the major upcoming refineries in Malaysia with a capacity of 300 mbd in 2024. Pakistan will be the third largest among the countries in Asia with planned and announced refining capacity of 535 mbd in 2024. The Khalifa refinery is the largest upcoming refinery in Pakistan. It is an announced refinery with an expected refining capacity of 250 mbd. It is expected to commence operations in 2023.

Oil Refining Capacity to Reach 443 MMTPA by 2030

Oil Public Sector Undertakings (PSUs)/Joint Venture (JV) refineries have plans for capacity addition including investment in Greenfield refineries. The refining capacity is expected to increase from 249.4 MMTPA currently, to about 443 MMTPA by 2030. Government has decided that Bharat Stage-VI (BS-VI) emission standards fuels will be

implemented across the country w.e.f. 01.04.2020 and supply of BS-VI fuels in National Capital Territory (NCT) of Delhi has been started w.e.f. 01.04.2018. Government has also started supply of BS-VI auto fuels in 20 Districts of Rajasthan, Uttar Pradesh & Haryana. To meet the incremental demand of petrol and diesel, refineries have capacity expansion/upgradation plan including for supply of BS-VI quality petrol and diesel. Government has also notified the National Policy on Biofuels-2018 on 8.6.2018. The goal of the Policy is to enable availability of bio fuels to increase blending. An indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel is proposed by 2030. The goal is to be achieved by reinforcing ongoing ethanol/biodiesel supplies through increasing domestic production, setting up Second Generation bio refineries, development of new feedstock for biofuels, creating suitable environment for biofuels and its integration with the main fuels etc.

Unique Group Strengthens APAC Presence with Acquisition and Key Appointment

Leading integrated subsea and offshore solutions provider, Unique Group has announced the acquisition of the Australian-company Western Advance's Marine Division and appointment of Chris Forde as its new regional vice-president. Western Advance's integration with Unique Group ties in with the Group's strategy to enhance its portfolio of autonomous solutions for marine, offshore and subsea industry operations in the region.



Mr. Chris Forde, Regional Vice President APAC, Unique Group

Mr. Harry Gandhi, Chief Executive Officer at Unique Group, commented: "Over the years, Unique Group has built a strong presence in APAC offering survey equipment, buoyancy and ballast, diving and life support and on-site engineering products and services to our customers. The acquisition of the marine division of Western Advance, provides us with an established Australian presence, thus enabling us to add value to our clients in the area. In order to spearhead the Group's strategic expansion plans, we have also appointed Mr. Chris Forde as Regional Vice-President for APAC. Under his leadership, the group aims to see further growth and expansion across the region. Having previously held senior management roles with Schlumberger and Viking Seatech and brings over 20 years' experience in the subsea oil and gas industry and will be an undoubted asset to the Group. Mr. Mike Pugh, Managing Director at Western Advance, comments, "In recent years Western Advance has worked in partnership with Unique Group in Australia developing and expanding the marine rental division, incorporating Unique Group's specialist products into our existing offerings and growing the range of world-class products offered to the Australian market. The sale of Western Advance's marine division facilitates an established Australian chapter for Unique Group adding to their existing local presence in the USA, UK, South Africa, India, Europe, Middle East and Singapore."

AG&P, ADNOC Logistics and Services Sign Agreement for the Long-term Charter of FSU



Atlantic Gulf & Pacific (AG&P), the global downstream gas and LNG logistics company, and ADNOC Logistics and Services (ADNOC L&S) have signed an agreement for the conversion, supply, operations and maintenance of a Floating Storage Unit (FSU) at AG&P's new LNG import facility located within Karaikal Port in Puducherry, India. The 137,756 cubic meter FSU owned by ADNOC L&S is being chartered for 15 years through an innovative commercial model enabling supply to be scaled to match demand.

Construction on the terminal will begin in Q1 2020 with commercial operations expected to commence before the end of 2021. The Karaikal FSU will be only the 4th FSU-based LNG import terminal in the world, after those in Malta, Malaysia and Bahrain. ADNOC L&S will provide a Japan-built, Moss-type containment vessel as FSU for the project from its fleet of eight LNG ships.

"This agreement with Atlantic Gulf & Pacific is significant for ADNOC Logistics & Services in a number of ways," said Abdulkareem Al Masabi, CEO of ADNOC L&S. "Firstly, it represents our first agreement with AG&P and one of our company's most important goals is to find creative ways to branch out and find new partnerships around the world to fuel our company's safer, smarter growth. It is also an important agreement because it provides AG&P with additional storage flexibility for their LNG terminal as well as giving us the chance to generate more value from one of our historical assets which is coming to the end of its current contract."

Owned and operated by AG&P, the LNG import facility at the Karaikal Port will have initial capacity of 1 million tonnes per annum (MTPA) which will be expanded to 3 MTPA in the medium term as demand increases. The terminal will serve domestic, industrial and commercial customers within a 500km radius, including the heavily industrialized region of central Tamil Nadu, which has major manufacturing clusters for the fertilizer, cement, steel, textile, leather, sugar and garment industries. In addition, it will serve gas-fired power plants as well as AG&P's own extensive city gas distribution network across South India.

Mr. Karthik Sathyamoorthy, President of AG&P Terminals & Logistics, said: "We are privileged to work with ADNOC L&S, one of the world's leaders in LNG logistics with an extensive, state-of-the-art, highly-maintained fleet. Both of our companies will work very closely to provide a comprehensive LNG solution for our downstream customers through the Karaikal LNG Facility. AG&P has focused on bringing down the unit cost of re-gasification terminals for smaller volumes. AG&P and ADNOC L&S are excited to reach this critical goal for our customers."

Oil and Gas Companies Getting Attracted towards Arctic Region

The Arctic region is largely under-explored due to its cold, harsh climatic conditions, frozen seas and lack of investment in infrastructure development. However, this picture is gradually changing. Dwindling oil and gas reserves worldwide is raising the case for exploration and production (E&P) companies to venture into the Arctic in search of hydrocarbons, according to GlobalData.

The company's latest thematic report, 'Arctic Exploitation', evaluates the competitive position of different Arctic countries in tapping the hydrocarbon reserves of the region. E&P activities in the Arctic are primarily concentrated in the onshore and shallow water regions of Russia, Norway, and the US. Arctic operations of Russia and Norway are aimed improving their hydrocarbon reserves to overcome the anticipated decline in output from aging fields in other regions. Mr. Ravindra Puranik, Oil & Gas Analyst at GlobalData, comments: "Russia has the natural advantage of having the longest coastline along the Arctic, giving it the territorial right to explore its continental shelves. With incentives from the Russian Government and financial support from China, Russian oil and gas companies such as Gazprom, Rosneft and Novatek are looking to develop the Arctic region into a new oil and gas hotspot. "These companies are benefiting from global warming as the shrinking ice cover is enabling maritime activities in the region. By integrating strategic planning with resource development, Russia is working towards converting the Northern Sea Route as a cost efficient alternative to the Suez Canal and profit from trade and industrialization in the Arctic." For operators in the US, the productive shale patches in the Lower 48 region continue to gain preference over oil and gas fields in the Alaska North Slope. The major incentive for the US in exploring the Arctic is to protect its maritime boundaries and counter the growing influence of Russia and China in the region. GlobalData's thematic research identifies oil and gas companies such as Gazprom, Rosneft, Novatek, Equinor, and Hilcorp Energy as the key companies in the Arctic exploitation theme based on their recent activities in the region.

The Yamalo-Nenets Autonomous region of Russia continues to attract greater E&P activity from operators, such as Gazprom, Novatek, and Rosneft. Novatek is developing the region into a liquefied natural gas (LNG) hub with one liquefaction terminal presently operational and a few more in the pipeline. In the neighboring country of Norway, Equinor and other operators are evaluating the possibility of exploring the Barents Sea for natural gas prospects similar to the Snøhvit gas field. The Beaufort Sea remains a key area of interest among E&P operators in the US, such as Hilcorp and Eni. However, strong resistance from environmental groups have hindered E&P activities in offshore Alaska. Environmental groups have repeatedly opposed E&P activities in Arctic countries in an attempt to safeguard the sensitive ecology of the region. Lately, these groups have received substantial backing with the adoption of the United Nations' Climate Change Framework of 2015. The framework has also prompted several financial institutions including Royal Bank of Scotland, Societe Generale, Goldman Sachs, and ABN Amro to discontinue their exposure to oil and gas projects in the Arctic. Puranik concludes: "The call for limiting industrialization in the Arctic is bound to be severe in this new decade and might dictate the future direction of E&P operations in the region."

HPCL Commissions Palanpur-Vadodara Pipeline and Vadodara Marketing Terminal



HPCL has successfully commissioned Palanpur-Vadodara Pipeline (PVPL) and Vadodara Marketing Terminal as part of MDPL Capacity Expansion and PVPL Extension Project. The foundation stone of this prestigious Project was laid by Hon'ble Prime Minister Shri Narendra Modi on 22nd October, 2017 at Vadodara. The project has been commissioned within approved cost and scheduled period of completion.

The 18-inch diameter, 235 km multi product pipeline with a system capacity of 8 MMTPA has many feathers in its cap and among these, the most notable is successful execution of India's longest 18" Diameter Horizontal Directional Drilling (HDD) across river Sabarmati and ravines spanning 2239 meters. The Greenfield Marketing Terminal at Vadodara has 2.1 Lakh KL Storage capacity with fully automated Rail and Road Tanker loading facilities.

The Pipeline along with Vadodara marketing Terminal shall be a boon for delivering petroleum products to the markets of South Gujarat, Madhya Pradesh and part of Maharashtra. With the upcoming HRRL Refinery in Barmer, Rajasthan, PVPL facilities will further act as a game changer in evacuation of refinery product and meeting the demands of Central India markets with dynamic pricing scenarios.

UAE's ADNOC to Develop Huge Gas Reservoir Discovered on Abu Dhabi-Dubai Border

Abu Dhabi National Oil Co., the UAE's biggest energy company pumping some 3 million b/d, and Dubai's gas supplier will develop a new shallow gas reservoir with estimated reserves of 80 trillion standard cubic feet as the UAE seeks gas self-sufficiency. ADNOC will deploy capital, technology, and expertise to develop and produce shallow gas resources and conduct further exploration to assess further volumes and firm up

development costs. As part of ADNOC's 2030 strategy, the company also plans to tap gas from its gas caps and substantial unconventional gas reserves, as well as new natural gas accumulations, which will continue to be appraised and developed as the company pursues its exploration activities.

This is the first time ADNOC has explored for hydrocarbon resources in Dubai. The new reservoir, discovered on the Abu Dhabi-Dubai border, will

be supplied to Dubai Supply Authority (DUSUP), which caters to the energy needs of a number of utility and industrial companies in the UAE's second largest city. DUSUP currently imports gas from Qatar through Dolphin Energy, the joint venture between Abu Dhabi's Mubadala Investment Co, Occidental Petroleum and Total.

Last year, Abu Dhabi's Supreme Petroleum Council announced increases in hydrocarbon recoverable reserves of 7 billion stock tank barrels of oil and 58 TSCF of conventional gas, bringing the total to 105 billion STB of recoverable oil, 273 TSCF of conventional gas and 160 TSCF of unconventional gas resources. ADNOC officials have spoken of reaching gas "self-sufficiency" and even becoming a net exporter of the fuel in the long-term as the UAE emirate beefs up exploration and development of gas fields. ADNOC, which produces 10.5 Bscf/d of gas all in the UAE, is boosting its gas output with the help of international oil companies.

Germany's Wintershall and Italy's ENI are working with ADNOC to develop the Ghasha ultra-sour gas concession which is expected to produce over 1.5 Bscf/d by around 2025. In addition, ADNOC plans to boost production from its Shah sour gas field from about 1.3 Bscf/d to 1.5 Bscf/d through its joint venture with Occidental. It also plans to move forward to develop the sour gas fields at Bab and Bu Hasa. This is the second gas discovery announced in the UAE in a week. Last Monday, Eni and the UAE's Sharjah National Oil Corp. said they discovered gas and condensates in the emirate of Sharjah. SNOG said it was the first onshore Sharjah discovery in 37 years, with the well achieving flow rates of up to 50 Mscf/d of lean gas and associated condensate.

TechnipFMC Reaffirms Timeline for Separation into Two Industry-Leading, Diversified Pure-Play Companies

TechnipFMC has reaffirmed that its planned transaction to separate into two companies, TechnipFMC and Technip Energies, is well on track for completion in the first half of 2020. The Company anticipates completing the transaction in the second quarter of 2020 and intends to host a Capital Markets event in Paris for Technip Energies before completion of the spin-off.

The Company also announced that the E.U. Prospectus for the spin-off of Technip Energies will now include audited IFRS financial statements for Technip Energies for each of the fiscal years ended December 31, 2016 through 2019. In order to provide financial statements for the full year 2019, which will afford greater visibility into recent historical performance, the Company anticipates the release of its E.U. Prospectus after its annual filings (Annual Report on Form 10-K and U.K. Annual Report). In addition to the approval of the E.U. Prospectus by the Dutch Authority for the Financial Markets (AFM), the successful completion of the planned spin-off also remains subject to general market conditions, regulatory approvals, and final Board approval. While awaiting receipt of all final approvals, the Company and its employees will stay focused on delivering operational excellence and world-class service to its clients.

Mathura Refinery's Journey towards 100% Production of BS-VI Fuels



Bharat stage emission standards (BSES) are standards instituted by the Government of India to regulate the emissions of air pollutants from motor vehicles. The standards and the timeline for implementation are set by the Central Pollution Control Board under the Ministry of Environment, Forest and Climate Change. Since October 2010, Bharat Stage (BS) III emission norms have been enforced across the country which allowed Sulfur content in MS (petrol) & HSD (diesel) up to 150 ppm (parts per million) and 350 ppm respectively.

Emission norms were further tightened in the subsequent step in the form of BS-IV emission norms which were made effective from April' 2017. These norms allowed Sulfur in MS (petrol) & HSD (diesel) upto 50 ppm level.

As a major step towards reducing air pollution, in January 2016, Government of India (GOI), through a historic decision announced not only to skip the BS-V emissions norms but also decided to implement BS-VI norms on Pan - India basis w.e.f 1st April, 2020. A deadline was also set for rolling out cleaner (BS-VI compliant) fuel across the National Capital Territory (NCT) by Apr'18 & National Capital Region (NCR) by Apr'19.

At a time when all the Indian refineries were producing BS-IV compliant fuels, IOCL Mathura Refinery was the first refinery to take up the challenge to meet the requirement of supplying NCT region with BS-VI compliant fuels (Sulphur - Less than 10 ppm) with its existing facilities/ units. Same was successfully done in January' 2018, well before the stipulated date and the supply of BS-VI compliant fuels ex Mathura Refinery, to NCT & NCR has continued since then.

Further, in order to upgrade the total production of MS (petrol) & HSD (diesel) produced at Mathura Refinery to meet the most stringent BS-VI norms, some revamp projects were taken up under the Quality Improvement Project (QIP). These included modifications in existing process units including Diesel hydro Desulphurisation unit (DHDS) and Gasoline hydro Desulphurisation unit (Prime-G). Now, IOCL Mathura refinery has successfully completed the project jobs and has successfully commissioned the revamped facilities in January'2020.

With the commissioning of these facilities, Mathura refinery is now supplying 100% of its MS (petrol) & HSD (diesel) meeting the BS-VI norms.

It is very important to note that with the change in fuel specifications from BS-IV to BS-VI in MS (Petrol) and HSD (Diesel) will bring down sulphur by 5 times which is a whopping 80 per cent reduction and would make environment substantially cleaner. We all will be breathing cleaner air which is a huge health advantage to public at large.

IndianOil to Team up with Phinergy of Israel for Manufacture of Metal-air Batteries

In its quest to embrace emerging energy alternatives and to firm up viable, customer-convenient automobile battery technology options, Indian Oil Corporation (IndianOil) has firmed up its equity participation in Phinergy, Israel, for production of metal-air batteries. Phinergy specialises in aluminium-air (Al-Air) and zinc-air battery systems that have great potential applications in electric mobility and stationary applications. Aluminium is naturally available in India and their extraction and recycling technologies are also very well established. IndianOil's collaboration with Phinergy in the field of Al-Air will help in reducing import dependence of the country and isolates the country's energy requirements from global geo-political and currency risks.

To start with, IndianOil has taken a minority equity stake in Phinergy (Israel). IndianOil and Phinergy are now in the process of forming a Joint Venture in India for collaboration in the field of Al-Air battery system including research & development, customization, manufacturing, assembly, sell and service of aluminium-air energy systems technology. The joint venture intends to setup a factory in India to manufacture Al-Air batteries for Electric Vehicles and stationary applications and facilitate development of eco-system for Al-Air technology.

Referring to the affirmative step in battery technology space, Mr. Sanjiv Singh, Chairman, IndianOil, said that IndianOil is evaluating and firming up a number of opportunities to provide Indian automobile consumers feasible and scalable alternative energy options. "We are confident that this Al-Air battery technology would complement Lithium ion batteries to provide a hybrid solution for large-scale adoption of electric vehicles in the country. Al-air battery technology has advantages on a number of factors like range, energy density, safety of operations, life-cycle etc., the India-centric," he added.

Phinergy is a start-up in clean and high energy-density battery systems based on metal-air technology, which generates electricity using aluminium or zinc as an energy source mainly. Phinergy's CEO, Mr. David Mayer added "Phinergy is glad to join forces with IOCL and share the vision of enabling clean and affordable energy solutions for India". Both companies are in discussions with leading auto manufactures for adoption of this technology in 3Ws, cars & buses, and they have also shown interest in evaluation and subsequent adoption of this technology.

Haldor Topsoe and Sasol Unite to Offer Customers Single-point Licenses for Proven Gas-to-Liquids Solutions



Copenhagen, Denmark: Today, Topsoe and Sasol announced that they have entered into a collaboration agreement to jointly license their GTL technologies. For many years, the two companies have worked together on numerous GTL projects and technologies, and Topsoe's SynCOR™ technologies and Sasol's Fischer-Tropsch technologies have been licensed into several world-scale GTL ventures.

Under the collaboration agreement, the companies will continue to offer these core technologies and will now also provide Topsoe's hydroprocessing and hydrogen technologies. This gives potential customers access to a single-point licensing offering that covers the entire value chain from gas feed to liquid fuels. As single-point licensors, Sasol and Topsoe will offer customers all necessary technology licenses for a complete GTL solution and in addition provide basic engineering, catalysts, and hardware.

TechnipFMC has been pre-approved to provide licensor engineering support and carry out front-end engineering design, detailed design, procurement, and construction. TechnipFMC was the engineering, procurement and construction (EPC) contractor for the Oryx GTL facility in Qatar and has performed a number of front-end engineering designs for GTL facilities, including the Uzbekistan GTL.

"It is a pleasure to announce this collaboration. Together, Sasol and Topsoe now offer customers complete and proven end-to-end GTL solutions. This is unique and extremely valuable for customers seeking bankable GTL solutions for monetizing abundant natural gas reserves. With this collaboration, we now offer customers a full range of solutions based on many of Topsoe's core technologies, and we are excited to expand our companies' global leadership for proven gas monetization solutions," says Amy Hebert, Deputy CEO of Topsoe.

Marius Brand, Acting EVP Technology of Sasol, adds: "Sasol and Haldor Topsoe's technology relationship spans more than 20 years, through which we have successfully commercialized several advanced technologies. We are delighted to enter into this collaboration

arrangement, and with the support of TechnipFMC we're able to offer the best GTL technology to the market. Although Sasol announced in 2017 it would not pursue future equity participation in greenfield Coal to Liquids or GTL opportunities, we recognize that our Fischer-Tropsch technology has a role to play in monetizing in-country natural gas resources otherwise not accessible. In addition, the technology could play a significant role, in conjunction with renewable energy resources, in the conversion of greenhouse gases to sustainable liquid fuels. The combination of the Sasol and Topsoe technologies offers a proven and robust solution for these applications."

Tata Projects bags ₹ 6,000-crore orders in oil, gas refinery sector

Engineering firm Tata Projects on Thursday said it has bagged four contracts worth Rs 6,000 crore in the oil and gas refinery sector in Odisha and Rajasthan. Of the four orders, three are from state-owned HPCL Rajasthan Refinery Ltd (HRRL) and one from Bharat Petroleum Corporation Ltd (BPCL), the company said in a statement.

BPCL's order is for its 2G bio-ethanol project in Bargarh, Odisha, with a proposed production capacity of 100 kilolitres per day of second-generation ethanol. The other three orders pertain to HRRL's upcoming greenfield refinery-cum-petrochemical complex in Rajasthan.

The scope of these contracts includes work for crude and vacuum distillation unit (CDU-VDU), delayed coker unit with unsaturated LPG treating unit and vacuum gas oil hydrotreating unit and refinery. "As a leading engineering and technology company, we have a specialised division that executes construction of environmentally beneficial and challenging projects. Hence, we seek to undertake projects that improve the lives of communities and support national developmental objectives at the same time," Tata Projects Managing Director Vinayak Deshpande said.

Tata Projects provides end-to-end solutions to set up power generation plants, power transmission and distribution systems, fully integrated rail and metro systems, commercial buildings and airports, chemical process plants, water and waste water management solutions, complete mining and metal purification systems. "Energy is an area wherein every country needs to focus since it directly affects the economic growth and welfare of citizens. As a company, we are certain that these projects will further strengthen India's energy security while providing an impetus to national development," Tata Projects Chief Operating Officer (Industrial Systems) Satyanarayana K said.

MRPL Resumes Phase-3 Refinery Operations

Pursuant to emergency measures taken by Mangalore Refinery and Petrochemicals Limited (MRPL) on war footing, MRPL has been able to bring stability to the affected piperack in least possible time in spite of incessant rains hampering work progress. The process of commissioning of the Phase-3 facilities has begun while ensuring safety of all systems.

Float Level Transmitter



Stem carrying series of reed switches and resistors forms a potentiometer circuit, which extends to the full indicating length of the transmitter. As the float travels through the indicating distance, the magnet located within it tap off the reed switches thereby varying the resistance fed to the electronics, which in turn converts the change in resistance to industry standard analogue output.

It finds application in diesel tank, solvent tank, hydraulic tank, water tank (RO, DM, soft, raw), acidic and alkaline tank, STP tank, etc.

For details contact:

Filpro Sensors Pvt Ltd
No: 130, 10th Cross
Pete Chennappa Indl Estate
Kamakshipalya, Magadi Main Road
Bengaluru, Karnataka 560 079
Tel: 080-23286463
E-mail: sales@filprosensors.com

Hard Metal Slurry Pumps



ECH Series augments the extensive range of CRI Pumps. This range of hard metal slurry pumps offer 11 different sizes of pumps that are customized to suit the specific applications of the customer. High quality, better efficiency, heavy duty, corrosive and non-corrosive liquors, suspended solids, effluents, vertical and horizontal configuration and prompt sales services are

some of the key features that enhance the utility of ECH Series pumps.

For details contact:

CRI Pumps Pvt Ltd
7/46-1 Keeranatham Road
Saravanampatty, Coimbatore
Tamil Nadu 641 035
Tel: 0422-3027000
Fax: 91-0422-3027005
E-mail: corp@cripumps.com

Smart Probes



Vaisala offers six new smart probes for its Indigo product family, optimized for demanding industrial applications. New options for dew point and moisture in oil measurements bring more possibilities for industries to save energy, optimize processes, and improve product quality.

The new probes will improve customers' process efficiencies by providing accurate and reliable measurement data for their industrial processes. The capabilities of the

new probes are based on next-generation sensor technologies.

The new Vaisala DRYCAP Dew Point and Temperature Probes DMP5, DMP6, DMP7, and DMP8 are optimized for low humidity and high temperature or pressurized environments. Dew point measurements are particularly important in various industrial drying applications, eg, in ovens and compressed air systems. The dew point probes include Vaisala's DRYCAP sensor, which is immune to particulate contamination, water condensation, oil vapour, and most chemicals. Its fast reaction time gives it unmatched performance even in dynamic and low dew point applications, and the sensor's outstanding stability enables a long two-year calibration interval.

The Vaisala HUMICAP Moisture in Oil Probe MMP8 extends the Indigo product offering to include heavy industry applications such as measuring moisture in transformer or lubrication oils to protect engines from wear and shutdown. Also, Vaisala HUMICAP Humidity and Temperature Probe HMP3 is a general-purpose remote probe suitable for duct mounting in non-pressurized applications with moderate temperatures. The probe structure allows the sensor to be replaced in the field without tools, providing maintenance flexibility in demanding applications that might require periodic sensor replacement, such as paint booths. The HMP3 and MMP8 both include Vaisala HUMICAP thin-film capacitive humidity measurement technology, which has become the industry standard in humidity measurement.

All six new smart probes complement Vaisala's existing Indigo product family. The digital Modbus RTU connection enables both easy integration into other systems and standalone usage. The probes are also plug-and-play compatible with Indigo 200 transmitters, which offer various additional benefits such as a display for data visualization, easy access to probe configuration, and more options for connectivity, supply voltage, and wiring. For on-site configuration, diagnostics, and self-calibration, the Indigo probes can be connected to the Vaisala Insight PC software.

For details contact:

Vaisala Oyj
Vanha Nurmijärventie 21, FI-01670 Vantaa, Finland
Tel. +358 50 555 4420
E-mail: comms@vaisala.com

Multi-functional Leak Detector



The SeCorrPhon AC 200 is a multi-functional leak detector offering three functions in one: prelocation, pinpoint and correlation. The clever combination of these processes in one system allows you to confidently locate the leak regardless of the ambient conditions. With just a few finger strokes, you can quickly and easily switch between the various applications.

The water escaping from the leak causes the material in the pipeline to vibrate. These vibrations travel along the pipe and can be picked up as structure-borne noise, even at distant contact points, eg, fittings. The vibrations also travel through the ground up to the earth's surface as ground borne noise, albeit heavily muted. The SeCorrPhon system is your perfect assistant for detecting leaks because it makes the vibrations audible to the human ear and also records and displays the volume and frequency spectrum as a graph.

Place carrying rod TS 200 and the connected touch microphone TM 200 on fittings along the pipeline and evaluate the volume. By evaluating the noise intensity, you will be able to identify the section of pipeline where the leak is likely to be.

It evaluates the volumes in the identified section of pipe using ground microphone BM 200 (for paved surfaces) or BM 230 (for unpaved surfaces). Connect carrying rod TS 200 to a ground microphone and move over the pipeline in short intervals. The acoustic signal and the visual display of the intensity make it easy to find the maximum. The leak is then located with sufficient accuracy to allow confident excavation.

For details contact:

Hermann Sewerin GmbH
Robert-Bosch-Straße 3
D-33334 Gutersloh, Germany
Tel: +49 5241 934-0
Fax: +49 5241 934-444
E-mail: info@sewerin.com

Electronic Pressure Monitoring



SUCO offers wide range of electronic pressure switches, which are available as normally open (NO) or normally closed (NC) versions. An electronic pressure switch converts the medium pressure, which is present at the measuring cell into a digital, electrical switch signal (On/Off). An electronic pressure switch is more complex than a mechanical pressure switch, and thus generally more expensive. As an electronic pressure switch has no moving parts (relative to each

other), it usually has a much prolonged service life and provides a higher level of precision (depending on application). The hysteresis can be set over a wide range and virtually independently of the switching point. Electronic pressure switches can also be equipped with additional functions, such as optical displays and menu control.

Electronic pressure switches from SUCO do comply with all important industrial EMC Standards. The basis for the standards is the stricter thresholds for transient emissions in residential environments (EN 61000-6-3) and immunity for industrial environments (EN 61000-6-2).

SUCO uses different sensor types to offer a perfect fit to your application.

The different sensor technologies are ceramic thick film/measuring cell and oil filled sensors. Though, the jewel of their sensor technologies is the Silicone on Sapphire Technology (SoS-Technology) used in the premium 053x-range which offers excellent temperature and long term stability in combination of a high overpressure safety of 4 time. Thus, this range is an excellent choice for rough conditions in mobile hydraulics.

For details contact:

Bedaflow Systems Pvt Ltd
W-7, Sector-11
Noida, Uttar Pradesh 201 301
Tel: 0120-43299 - 90
Fax: 91-0120-43299 - 20
E-mail: info@bedaflow.com

Dry HCl Gas Generation Plant



Commercial Hydrochloric acid in the market is available as 30 per cent aqueous solution and is widely used in industry in large quantities. However, for certain application, such as hydrogenation reaction and in bulk drug/pharma industries, HCl is required in gaseous and anhydrous form.

Different processes for HCl gas generation from commercial grade HCl acid are offered based on customer requirement. These processes are as follows: concentrated sulphuric acid route, distillation or boiling route, and calcium chloride route.

HCl gas generation plants are normally available from 5 to 250 kg/hr capacity. Large capacity plants can also be provided on request.

Ablaze has a long and successful record of design and supply of several engineered systems for HCl gas generation. Being manufacturer and PTFE-lined components, Ablaze is well qualified to handle such systems, as these are the major material of construction (MoC) used in such systems, Ablaze also has in-house capabilities for instrumentation and automation, which is necessary for reliable and safe operation.

It finds application in chemicals, petrochemical, electronics and textile, steel and metal, pharma and biotechnology industries.

For details contact:

Ablaze Glass Works Pvt Ltd
E-52 Sardar Estate, Ajwa Road
Vadodara, Gujarat 390 019
E-mail: srshah@ablazeglassworks.com

Gas Separation Membrane



The SEPURAN green membrane cartridge consists of several thousand hollow fibres manufactured from high performance polymers and

wrapped with a SS casing. The ends are embedded in a resin. The membrane cartridge is contained in a SS pressure vessel. The cartridge and housing together comprise the SEPURAN green membrane module.

The membrane module can now withstand a gas mixture under pressure in which multiple modules can be piped together. The simple, easy to handle set-up results in a compact upgrading plant.

At present the SS housings manufactured for the SEPURAN green cartridges are made to conform to the respective country specific regulations. This allows plant construction companies to adapt flexibly to local pressurised equipment regulations. Housings for pressures of up to 20 bara and to 40 bara are available.

Today, Evonik offers SEPURAN green membranes and cartridge systems for biogas upgrading in various sizes. Choices of 2", 4" or 6" dia membranes are available to address plants of all sizes.

For details contact:

Evonik India Pvt Ltd
Krislon House, Saki Vihar Road
Saki Naka, Andheri (E)
Mumbai 400 072
Tel: 022-67238800
E-mail: aashish.maheshwari@evonik.com

Static Mixing System

Complete skid-mounted static mixing systems are designed to meet the needs of each user. The available mixer designs include the LPD, a low-pressure model typically used for low viscosity turbulent flow mixing of fluids and for gas-liquid mixing. This design is offered in many materials of construction and to 48-inch dia. These mixers are easily customized to include special feed nozzles and injectors for major and minor product streams.

The second design, the ISG includes specially machined elements with passageways that guarantee the mixing of any pumpable material. After passing through ten elements the ISG will layer materials over 2,000,000 times to provide a microscopically layered mixture. ISG elements are stackable in any quantity to provide mixing quality as needed in the process. The ISG is supplied in a range of cast or machined materials to suit the application through 12-inch dia.

For details contact:

Ross Process Equipment Pvt Ltd
Plot No: D-233/3, Chakan Indl Area
Phase II, Village: Bhamboli, Tal: Khed
Dist: Pune, Maharashtra 410 501
Tel: 02135-628400, 628401, 628402, 628403

Mass Spectrometer



AMETEK Process Instruments has broadened its line of process mass spectrometers to include the StreamPro, a field-proven system for critical process analysis and control applications. Because mass spectrometry is a very rapid analytical method that allows for the analysis of multiple components in seconds, the StreamPro quickly provides the user with actionable data.

Applications for the StreamPro include monitoring for any number of analytes (C1-C8, H₂, N₂, CO₂, CO, O₂, VOCs, and other components m/z 1-200 amu) in a broad range of markets: pharma, hydrocarbon processing, research and design, and process development.

Real-time process monitoring of multiple components is straightforward with the StreamPro's Process 2000 software. Complex overlapping spectra are handled automatically, with data output provided directly in concentration units. Different calibration and analysis methods can be assigned to each sample port. The software also provides an easy setup and operation, with advanced alarm and automation capabilities.

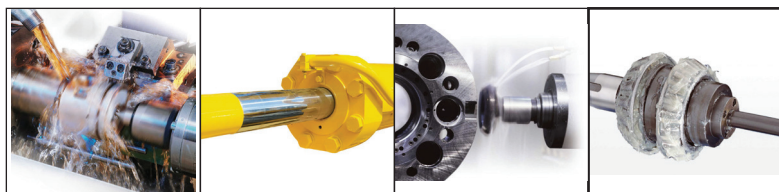
Autocalibration maintains the performance and accuracy of the system for quantitative analysis. The on-board computer activates the auto-start to prevent data loss or process interruption during a power failure. The analyzer has a streamlined, economical footprint, simplifying the installation.

With the StreamPro, there is no need for expensive service contracts that are typical with most process mass spectrometers. The system's self-diagnostics and modular design ensure ease of maintenance by on-site personnel for servicing or replacing key components, with remote support available for additional factory diagnosis and troubleshooting.

For details contact:

AMETEK Process Instruments
150 Freeport Road, Pittsburgh, PA 15238, U.S.A.
Tel: 412-828-9040, Fax: 412-826-0399
E-mail: sales.ametekpi@ametek.com

Lubricants



Lubricants are indispensable in industry. Greases and oils perform critical functions, ensuring that engines and machines run perfectly smooth. They extend the service life of machines, protect them from corrosion, cool them by dissipating process heat, act as a seal and prevent the formation of deposits.

Depending on the application, lubricants must possess a specific performance profile. For instance, hydraulic oils are subject to different specifications than heat treatment fluids. Lubricant manufacturers use specific additives to obtain these properties in their lubricants. These active ingredients are added to lubricants in order to achieve new, desirable properties and/or to eliminate unwanted ones.

LANXESS's Additives business unit are lubricant additives and synthetic lubricants for industrial applications such as in metal-working, power generation and aerospace. From synthetic lubricant base fluids to individual additives and additive packages, their high-performance products lubricate engines, machines and transport vehicles of all kinds.

Additive packages are combinations of additives carefully selected to perform several tasks. They meet special customer and OEM requirements and comply with today's strict industrial standards. Additive packages facilitate the production of high-quality lubricants, reduce development time and development cost at their customers and simplify inventory management.

Whether to protect engines or drive-trains from wear or to extend the service life of machines, LANXESS develops products for specific purposes so that they meet the most stringent specifications and performance standards.

Lubricant Additives offers an extensive product line under the brand names Additin, Lobase, Calcinate, Hybase, Naugalube and Durad. The brand names Hatcol and Synton stand for synthetic, high-performance base fluids. Reolube hydraulic fluids are used in special applications which not only require good lubrication, but also impose max demands for fire resistance.

For details contact:

LANXESS India Pvt Ltd
LANXESS House, Plot No: A-162, A-163, A-164
Road No: 27, Wagle Estate, Opp: ITI College, MIDC, Thane (W), Maharashtra 400 604
Tel: 022-25871000, Telefax: 91-022-25826742

PRODUCTS

Energy Saver



Emotron FDU 2.0 helps you to save energy and draw max efficiency from your processes. Emotron FDU with modular concepts allows cost-optimisation and is a perfect choice for tailor-made requirements. It offers simplicity in its most advanced form, which

makes it easy to program and is user-friendly.

Operation parameters can be set in your process units. Robust and certified IP54 metal construction as standard (up to 132-kW) offer cost-efficient installation close to the application. One Emotron FDU can control up to seven units without external control system. Speed controlled fans assures less noise, a more even drive temperature and higher efficiency. 6 pulse and 12 pulse configurations are also available.

For details contact:

CG Power and Indl Solutions Ltd
Drives and Automation
Plot No: 9, MPAKVN, Phase 2

New Indl Area, Mandideep

Madhya Pradesh 462 046

E-mail: drives.mktg@cgglobal.com / drives.service@cgglobal.com

Submersible Dewatering Pumps



MBH dewatering pumpsets are portable pump units with pump below and motor above construction. The motor is submersible squirrel cage, induction type and dry type with Class F insulation and IP-68 enclosure fitted with ball-bearings and mechanical seals. It is rated for 415 +/-10 per cent c/s AC supply.

The pump motor unit of close-coupled and jacketed construction design provide effective water cooling of the motor by liquid flowing around the motor casing up into the discharge main.

It can pump out liquid from the lowest level; submersible installation, hence no need of foundation or pump house; cuts civil cost by nearly 50 per cent; can be installed in collection well; and being portable, it can be shifted/handled easily.

For details contact:

MBH Pumps (Gujarat) Pvt Ltd

Plot No: 14, GIDC, Naroda Indl Estate

Ahmedabad, Gujarat 382 330

Tel: 079-22823066, 22821018

E-mail: marketing@mbhpumps.com

Intelligent Submersible Pumps



Grundfos offers excellent and robust dewatering solutions with its pumps and systems. DPK and DWK are submersible dewatering, draining pumps by design. These pumps can handle a particle size up to 15-mm and can be installed in the basements to manage the situation. They are an ideal solution as reliability and modularity are key elements required in critical situations. These pumps are highly useful in flood prone areas, construction sites and can also help to manage the critical situation.

These drainage or dewatering pumps are equipped with a semi-open or enclosed impeller with a robust cast iron construction to improve their durability. They are intended for submersible use in underground collection tanks in and around buildings for cost effective run-off management. They also have flexible installation options as they can be free-standing on a ring stand or be permanently installed on an auto-coupling system.

The DPK.V range of pumps is designed with a state-of-the-art super vortex impeller to transfer sewage to make run-off management efficient. DPK.V pumps have a particle handling capability of 65-mm (or) 80-mm, hence they can be put into operation where there are coarse particles floating in the water. With the super vortex impeller, the design minimizes clogging. This makes DPK.V ideal to transport wastewater.

The DWK pump range is primarily used for dewatering in construction sites. Their corrosion resistant components protect them from the harsh environments of a construction site. The primary differentiator between a DPK and DWK pump is in their discharge arrangement style. The discharge is placed on top and does not require any additional support to be placed. This will allow pumps to be put through the smallest manholes to displace water.

It finds application at construction sites, run-off management, excavations, tunnels and drainage pits. The durability, modularity and efficiency of these pumps make them the perfect dewatering and drainage solution at commercial establishments and construction sites.

For details contact:

Grundfos Pumps India Pvt Ltd

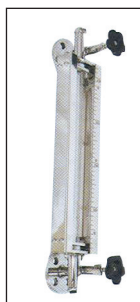
118 Rajiv Gandhi Salai, Thoraipakkam

Chennai 600 097

Tel: 044-45966800, Fax: 91-044-45966969

E-mail: oneoffice.india@sales.grundfos.com

Tubular Level Indicator



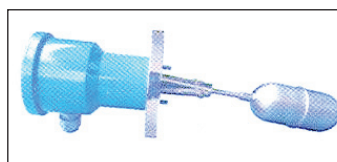
Tubular level indicator allows easy viewing of the liquid in the low to medium pressurised vessel/tank. These gauges are fitted parallel to the process vessel/tank.

It finds application in water tank, acidic and alkaline tank, bulk storage tank, filter tank, oil and crude tank.

For details contact:

Filpro Sensors Pvt Ltd
No: 130, 10th Cross, Pete Chennappa Indl Estate
Kamakshipalya, Magadi Main Road
Bengaluru, Karnataka 560 079
Tel: 080-23286463
E-mail: sales@filprosensors.com

Side-mounted Level Switch



The float lever carries a permanent magnet, which is repelled by similar magnet mounted in the switch housing.

The magnet having the same pole directed towards each other are separated by a non-magnetic diaphragm. The glandless construction offers excellent sealing.

It finds application in hydraulic oil, boilers, and chemical and pharma industries.

For details contact:

Filpro Sensors Pvt Ltd
No: 130, 10th Cross, Pete Chennappa Indl Estate
Kamakshipalya, Magadi Main Road
Bengaluru, Karnataka 560 079
Tel: 080-23286463
E-mail: sales@filprosensors.com

Submersible Sewage & Effluent Pump



MBH non-clog submersible sewage pumps offer the most reliable way of solving the pumping and disposal of sewage containing suspended solids. MBH non-clog submersible sewage pumps are of close-coupled compact design and having a pump below and a motor above, sump cleaning is possible to a max level. These are powered by squirrel cage induction dry motors suitable for operation at 400/440-V, 3-phase, 50-Hz, AC supply. They are also noise-free in operation.

The bearing arrangements with double angular contact ball bearings with deep groove ball bearings give the best resistance to the radial and thrust load combination in a centrifugal pump. The life rating is over 40,000 hours.

The bearings are lubricated for life with high temperature grease. The housing is totally dust and waterproof for

submersible duty. The cooling is done externally and the special insulation of the winding takes care of rise in temperature during intermittent operations. Special triple protection does not permit any liquid entry into the dry motor. The moisture detector indicates any moisture penetration into the motor.

Built-in temperature sensors enable tripping of the motor if the temperature rises above 150°C and restarts at 80°C, giving complete dry run protection. Max permissible liquid temperature is 50°C. The guide rail system for lowering and lifting the pump is an outstanding feature. The pump slides down on to the duckfoot bend and engages with it without bolting. It is not necessary to enter the sump to carry out inspection and maintenance work.

All MBH pumps have as standard equipment double mechanical seals which seal off the motor from the pump section. The seal has seal faces made from silicon carbide for long life. The design of the oil chamber ensures efficient cooling of the seals. Depending on the liquid, impellers may be semi-open or closed, running against a wear disc or casing ring. For industrial sewage, single-, two-channels or vortex impellers can be used. A shaft with a die-cast rotor on the motor side and a shaft protection sleeve on the pump side ensures better life for the shaft. The compact seat arrangement has minimised shaft over-hang and consequently minimises shaft deflection. The motor portion is isolated from the pump by an intermediate casing with double mechanical seal in the oil chamber.

For details contact:

MBH Pumps (Gujarat) Pvt Ltd
Plot No: 14, GIDC, Naroda Indl Estate
Ahmedabad, Gujarat 382 330
Tel: 079-22823066, 22821018
E-mail: marketing@mbhpumps.com

Dock Shelters



Sheltered, safe and secure materials handling is the concern of all the industry nowadays, in the logistics area

of any industry where the material is usually prone to dust, rainfall, insects, etc; the need of sheltered materials handling is the top concern.

In order to facilitate sheltered materials handling, loading docks are equipped with the dock shelters and dock seal.

Dock shelters and dock seals are placed at the exterior of the doors openings and forms a shelter between the dock bay and the lorry while the loading or unloading of the material is taking place.

The vehicle reverses into the dock shelter which seals it off, giving weather protection during the loading and unloading. Their range of dock shelters is most suitable at sites when a tight seal is needed.

For details contact:

Avians Innovations Technology Pvt Ltd
Gat No: 60/61, Dehu-Moshi Road, Chikhali
Pune, Maharashtra 412 114
Tel: 020-71400600
Fax: 91-020-71400654

High-pressure Pump



KaiPUMP is a vertical multi-stage pump which is driven by a standard motor. It can be used to convey a variety of mediums from tap water to industrial liquid at diverse temperatures and with different flow rates and pressure. Where there is a requirement of liquid to be

transported at a high pressure KaiPUMP can be utilised by using multiple impellers or stages in the body of the pump. As the flow progresses through multiple stages of KaiPUMP, pressure is built within the pump that enables it to move contents to a longer distance. It can be used for negative displacement as well as for positive displacement application. It has many applications in industries like industrial boosting, industrial conveying, water treatment and irrigation.

It finds application in reverse osmosis, boiler feed, fire fighting system, industrial water supply, pressure boosting, etc.

For details contact:

Arvind Envisol Ltd
Arvind Mill Premises
Naroda Road, Ahmedabad
Gujarat 380 025
E-mail: support.kaigo@arvind.in

Pressure Switches



The new PLUS Series offers the versions NC (normally closed) or NO (normally open) with integrated connectors like DEUTSCH 2P or 3P, AMP Superseal, Packard MetriPack 280, AMP Junior Timer, M12 x 1 and others. The electric contact will easily be reached by just putting together the integrated connectors with the counter plug. Thereby these product series are designed according to the protection degrees IP67 (or IP6K9K) depending on the used connector. These approved standard pressure switches have been further developed and include now additionally security functions.

Moreover, SUCO offers the versions which include diagnostic functions (fail-safe) with short-circuit and cable break detection according to NAMUR. Such versions are of a special interest for safety systems as for example brake systems, hydrostatic steering systems or fire-fighting systems. The PLUS Series pressure switches are also available in a version with varistor that allows limiting the flyback voltage efficiently. Thereby the generated overvoltage protection extends the contact lifecycle. Furthermore, an active reduction of EMI emissions will be reached by switching of the pressure switches.

Temperature-controlled switching, which can be interesting for the filter monitoring, will be the next development step. Due to this function it is easy to avoid the incorrect switch status at low temperatures and hence high viscosity of the medium.

For details contact:

Bedaflow Systems Pvt Ltd
W-7, Sector-11
Noida, Uttar Pradesh 201 301
Tel: 0120-43299 - 90
Fax: 91-0120-43299 - 20
E-mail: info@bedaflow.com

Oil & Gas World Expo Conference 2020

INAUGURAL CEREMONY

Wednesday, 4th March, 2020



Venue: Bombay Exhibition Centre, Goregaon (East), Mumbai.

Theme: Revitalization of Mature Fields Using Innovative Technologies

Registration / Tea & Coffee : 9:00 am – 9:30 am

Inaugural Ceremony (Time: 09:30 am to 10:45 am)	
Welcome Address	Mr. Maulik Jasubhai , Chairman & Chief Executive Jasubhai Group & Chemtech Foundation
Address by the Chairman	Mr. S K Moitra , Director (Onshore), Oil and Natural Gas Corporation Limited
Keynote Address	*Mr. Shashi Shanker , Chairman & Managing Director Oil and Natural Gas Corporation Limited
Keynote Address	Mr. Sushil Chandra Mishra , Chairman & Managing Director - Oil India Ltd
Keynote Address	Mr. Subramanian Sarma , CEO & MD, L&THE
Keynote Address	Ms. Ann Ollestad , Consul General, Consulate General of Norway in Mumbai
Concluding Remarks	Mr. P K Sharma , Director Operations, Oil India Ltd & Technical Chairman, Central Advisory Board – Oil & Gas World Expo 2020

Tea / Coffee: 10:45 am To 11:00 am

SESSION I: (Time: 11:00 am to 12:15 pm) Exploration & Subsurface

Session Chairman: Mr. R K Srivastava, Director (Exploration) – Oil and Natural Gas Corporation Limited

TBA	Dr. C Laxma Reddy , ADG – Exploration, Directorate General of Hydrocarbons
Emerging Technologies – Applications in Field Development & Management	Mr. M Suresh Kumar , Head Subsurface Cairn oil & Gas, Vedanta
Effective use of Duplex Stainless Steel in Offshore Topsides Application	Mr. Claes Tigerstrand , Head, South Europe Technical Market Development, Outokumpu
Innovative Solutions for Intelligent Oilfields Accomplishing Safe and Profitable Operations	Mr. Rajan Sinnarkar , Director Flow Products Emerson Automation Solutions, India

SESSION II: (Time: 12:15 pm to 01:30 pm) Drilling & Completion Technologies

Session Chairman: Mr. Jayesh Kumar, Chief Well Services, ONGC

Horizontal multi-lateral drilling in shallow CBM reservoirs	Mr. Kshitij Dwivedi , AVP Drilling & Completions, Reliance Industries Limited Mr. Ashish Sanon , Project Lead Drilling & Bundled Services, Baker Hughes
A step change in Performance Efficiency for Harsh Drilling Conditions- Case study from Mizoram	Mr. Pratyush Tewari , Drilling Head, Schlumberger
Underwater coatings for Offshore Applications	Mr. Mahesh Aradhye , Associate Vice President (R&D) Grauer & Weil India Limited

Lunch Break: 1:30 to 2:15 pm

International Conferences

SESSION III: (Time: 2:20 pm to 03:30 pm) Production & Development

Session Chairman: **Mr. Alok Kumar Gupta**, Director Operations, ONGC Videsh Ltd

Session Co-Chair: **Mr. K S Pandey**, Executive Director, Asset Manager, Neelam Heera Assets ONGC

EOR/IOR	Mr. O N Gyaani , ED, Head IRS, ONGC
ASP Formulation and Pilot Design for Production Enhancement in Mature Oilfields	Mr. Shrinidhi Shetty , Senior Reservoir Engineer Baker Hughes
Overview of and experiences with advanced multiphase (gas, oil, water & sand) separation & processing technologies for brownfield upgrading of existing off- and onshore production facilities	Dr. Khalil Sharara , Head of Technical Sales Upstream Systems, INME in Sulzer Chemtech Ltd
TBA	Mr. Vijay Rajpurohit , Managing Director, Chemical Process Piping Pvt Ltd

Tea/coffee: 3: 30 pm to 3:45 pm

GAS Tech World Expo Conference 2020

INAUGURAL CEREMONY

Wednesday, 4th March, 2020



Venue: Bombay Exhibition Centre, Goregaon (East), Mumbai.

Theme: Unlocking Natural Gas Value Chain Potential in India

Registration / Tea & Coffee : 08:30 am – 9:30 am

Inaugural Ceremony (Time: 09:30 am to 11:00 am)

Welcome Address	Mr. Maulik Jasubhai , Chairman & Chief Executive Jasubhai Group & Chemtech Foundation
Address by the Chairman	Mr. Rajeev Mathur , Executive Director (Corporate Affairs) & OSD to CMD, GAIL Ltd
Keynote Address	Dr. Ashutosh Karnatak , Former CMD, GAIL Ltd
Keynote Address	Mr. R P Natekar , Executive Director (Planning and Corporate Affairs), BPCL
Keynote Address	Mr. B C Tripathi , former CMD, GAIL Ltd
Keynote Address	Mr. R C Bhargava , Chairman, Maruti Suzuki India Ltd
Keynote Address	Mr. D K Sarraf , Chairperson, Petroleum & Natural Gas Regulatory Board

Special Address: (Time: 11:00 am – 11:15 am)

Global Gas Scenario	Mahmoud Jardaneh , Department of Energy Attaché Embassy of the United States of America
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Tea / Coffee: 11:15 am To 11:30 am

SESSION I: (Time: 11:30 pm to 01:00 pm) Challenges & Opportunities for Stakeholders of Industry: Suppliers, Buyers & Policymakers

Session Chairman: *Mr. Sarthak Behuria, Executive Director – LNG and LPG Division, Adani Group

Presenter & Moderator: Ms. Gauri Jauhar, Executive Director, IHS Markit

Presenter : Mr. Prashant Banerjee, Executive Director – Society of Indian Automobile Manufacturers

Panelists
Mr. Ashwani Dudeja, Country Head , Shell Energy India
Mr Ashish Chutani, Head Government & Policy Affairs, Maruti Suzuki India Ltd
Mr. S K Pathak, Managing Director, Rajasthan State Gas Limited
Mr. Prasanna Kumar, Executive Director – Fuel Management, NTPC
Mr. Amit Garg, Director Commercial, Indraprastha Gas Ltd
Q&A

Lunch Break: 1: 00 to 2:00 pm

SESSION II: (Time: 2:00 pm to 03:30 pm) Diversification of Energy Basket & Inclusion of Clean Energy Resources

Session Chairman: Mr. Rajiv Sikka, CEO, Indian Oil – Adani Gas Pvt Ltd

Bio CNG	Mr. Debadatta Mishra , AVP & Head Business Development (CBG) Praj Industries
Small-Mid Scale LNG Infrastructure Modularized Solutions	Mr. Julian Terpitz , Product Development Manager, TGE Gas Engineering
LNG as auto fuel for HDV/Buses	Mr. Vinod Tahlilani , CEO, India Gas Solutions
Q&A	

Tea/coffee: 3: 30 pm to 3:45 pm

SESSION III: (Time: 3:45 pm to 05:00 pm) : Policy & Regulatory: Development of Gas Infrastructure

Moderator & Anchor Presenter: Mr. Vivek Joshi, Executive Director, Natural Gas Society

Panelists
Mr. Mahesh Shedbal, VP Commercial, Pipeline Infrastructure Limited
Mr. Deepak Mahurkar, Partner Leader Oil & Gas Advisory PwC India
Mr. Rajesh K Mediratta, Director – Strategy, Regulatory & Communication, India Energy Exchange
Dr. S.S. Thipse, Senior Deputy Director, Power Train Engineering (PTE), In-Charge Environmental Research Laboratory, ARAI
Mr. G K Sharma, Vice President (Marketing), Petronet LNG Ltd
Q&A

Power World Expo Conference 2020

INAUGURAL CEREMONY

Thursday, 5th March, 2020



Venue: Bombay Exhibition Centre, Goregaon (East), Mumbai.

Theme: Clean & Affordable Power: Innovation, Integration & Adoption

Registration / Tea & Coffee : 09:00 am – 10:00 am

Inaugural Ceremony (Time: 10:00 am to 11:15 am)	
Welcome Address by the Chairman	Mr. A K Gupta , Director (Commercial). NTPC Limited & Chairman, Central Advisory Board - Power World Expo 2020
Address by the Head Technical	Mr. Manoj Kumar Varma , Director (Power), Bharat Heavy Electricals Limited & Head – Technical, Central Advisory Board, Power World Expo 2020
Keynote Address	*Mr. K. Sreekant , Chairman & Managing Director, Power Grid Corporation of India Ltd.
Keynote Address	*Mr. Rajeev Sharma , Chairman and Managing Director Power Finance Corporation
Keynote Address	Mr. Pranav R Mehta , Chairman – Global Solar Council (GSC) & Founder Chairman, National Solar Energy Federation of India
Guest of Honour	Dr. Anil Kakodkar , Former Chairman, Atomic Energy Commission & Chairman, Rajiv Gandhi Science & Technology Commission
Chief Guest	* Dr. Nitin Kashinath Raut , Hon'ble Minister - New and Renewable Energy - Government of Maharashtra
Concluding Remarks	Mr. A K Jha , Former CMD , NTPC Limited & Convener - Power World Expo 2020
Vote of Thanks	Mr Shailendra Roy , CEO & MD – L&T Power & Whole-Time Director & Member of the Board, Larsen & Toubro Limited

Tea/Coffee: 11: 15 am to 11:30 am

SESSION I: (Time: 11:30 am to 1:00 pm) Renewable Energy & Storage Technologies

Session Chairman: **Mr. Pranav R Mehta**, Chairman – Global Solar Council (GSC) & Founder Chairman
National Solar Energy Federation of India

Optimal energy mix for reliable grid operation in the emerging scenario	Mr. Vivek Pandey , Dy. General Manager, Western Regional Load Despatch Centre - Power System Operation Corporation Limited
RE forecasting and scheduling	Mr. Vishal Pandya , Cofounder Director, REConnect
Energy Storage Platforms	Mr. M. Karthikeyan , Incharge - Application Engineering, Delta Electronics
Q&A	

Lunch Break 1:00 pm – 2:00 pm

SESSION II: (Time: 2:00 pm to 3:30 pm) Renewable Energy Integration with Conventional Sources: Challenges & Solutions

Session Chairman: Mr. Anand Awasthy, Managing Director, NTPC-GE

Large integration	Mr. B. B. Mehta, Chief Engineer(SDLC), GETCO
Case studies on automatic generation control	Mr. N. Nallarasana, Chief General Manager - System operation, National Regional Load Despatch Centre - Power System Operation Corporation Limited
Retrofitting / R&M of thermal stations for flexibility services like ramping, part load operation including synchronous condensers for Voltage support	Mr. Siddharth Gupta, General Manager & Head, Sales & Tendering, L&T-MHPS Boilers Private Ltd Mr. Chinmoy Mohanty, General Manager Sales - Services & Upgrades, GE (Power)
Q&A	

Tea/Coffee: 3:30 to 3:45 pm

SESSION III: (Time: 3:45 pm to 5:45 pm) : Smart Power: Digitalization & Data Analytics

Session Chair: Mr. V K Shrivastava, Executive Director, Western Regional Load Despatch Centre - Power System Operation Corporation Limited

Dynamic modeling and simulation studies	Mr. Anupam Goel, President, ENERZINX, Dallas
Data analytics & digitalization	Mr. M. G. Gadhi, Superintending Engineer(SDLC), GETCO
Improvements in generator parameter tuning using PMU data	Mr. Vinod Kumar, Deputy General Manager-R&D, Hitachi India Pvt. Ltd
Digitalization & data analytics for power generation	Mr. R. S. Sharma, Managing Director, Bajaj Energy - Lalitpur Power Generation Company Ltd
Q&A	

Refining & Petrochemicals World Expo Conference 2020

INAUGURAL CEREMONY

Thursday, 5th March, 2020

Venue: Bombay Exhibition Centre, Goregaon (East), Mumbai.

Theme: Transformation of Refining & Petrochemicals: Vision 2030



Registration / Tea & Coffee : 09:00 am – 10:00 am

Inaugural Ceremony (Time: 10:00 am to 11:30 am)	
Welcome Address	Mr. Maulik Jasubhai, Chairman & Chief Executive Jasubhai Group & Chemtech Foundation
Address by the Chairman	Mr. Prasad Panicker, former Executive Director - Kochi Refinery, Bharat Petroleum Corporation Limited
Keynote Address	*Mr. R Ramachandran, Director Refineries Bharat Petroleum Corporation Limited
Build Own Operate model for industrial gas supply	Mr. Richard Boocock, Senior Vice President, Chief Information Officer and Special Advisor to the Chairman Air Products
Guest of Honour	Mr. B Narayan, Group President (Procurement & Projects) Reliance Industries Ltd

International Conferences

SESSION I: (Time: 11:30 am to 01:00 pm) Technology

Session Chairman: *Mr. R K Ghosh, Cluster President, Reliance Industries Ltd

Creating, Managing and Leveraging Digital Twins	Mr. Amit Shrivastava , Director, Bentley Systems
HIGEE technology for efficient Process Intensification	Mr. C.V. Natarajan , Vice President Marketing, Trilok Corporation
Leveraging IR4.0 to Drive Operational Excellence & Profitability in Refining & Petrochemicals Industry	Mr. Akshay Gupta , Business Development Manager- Connected Performance Services, Honeywell UOP

Lunch: 1: 00 pm to 2:00 pm

SESSION II: (Time: 02:00 pm to 03:30 pm) Sustainability & Environment

Session Chairman: *Mr. Mahendra Pimple, MD, Bharat Oman Refinery Ltd (BORL)

2 nd Generation Biofuels : Producer's Perspective	Mr. M S Patke , ED - Biofuels, BPCL
2 nd Generation Biofuels : Technology Provider's Perspective	Mr. Vasudeo Joshi , Vice President & BU Head — Advance Biofuels & Renewable Gas, Praj Industries
Coatings- Effectiveness for protection of Oil & Gas Assets	Mr. Sanjay Lodha , Global Business Director- Tubacoat Tubacex Spain
Controlling Fugitive Emissions	Mr. T R Varadhan , Director, Mascot Systems
Q&A	

Tea/Coffee: 03: 30 to 4:00 pm

SESSION III: (Time: 4:00 pm to 05:30 pm) : Operational optimization

Session Chair: *MRPL

Session Co Chair: Mr. Ajay Jain, Director Project Management, Fluor India

Role of Modelling & Simulation in Design & Troubleshooting for Refinery	Mr. Nilesh Gandhi , GM, R&D Group, Reliance Industries
Integrated Safety & Security	Mr. Deepak Jaiswal , Director, Imagenous Engineering Pvt. Ltd
High Performance stainless steel & Nickel alloys to mitigate corrosion in Petrochemical & refining industry	Mr. Deepak Vaidya , Business Head — India BA Europe, Outokumpu
Q&A	

PANEL DISCUSSION: (Time: 5:30 pm to 06:30 pm) : Digital Refining

Moderator: Mr. Amit R Verma, Senior VP & Head of P & C Digital Transformation, Reliance Industries

Mr. Gaurav Moda , Managing Director (Resources) Accenture
Mr. C J Iyer , former Executive Director , BPCL — Mumbai Refinery
Mr. Vishal Mehta , Senior Director, Worley Integrated Digital Solutions
Ms. Khushbu Chaplot , Head of Digital Solutions, Emerson Automation Solutions India
Mr. Minesh Tendulkar , Senior Director — Centre of Excellence, Aspen Tech
Q&A

Oil & Gas World Expo 2020**Date:** 4-6 March 2020**Venue:** Bombay Exhibition Centre, Goregaon (East), Mumbai, India

Event: The 9th edition of Oil & Gas World Expo is scheduled from March 4-6, 2020 in Bombay Exhibition Centre, Goregaon (East), Mumbai, India. The Global Hydrocarbon show is aiming to connect, discuss and comprehend the views of leaders, policy makers, regulatory authorities, and service providers of the Indian and Global hydrocarbon industry. The 3-days Exhibition and dedicated conference will provide a platform to showcase innovative technologies and services, encompassing current and future trends in the entire value chain of hydrocarbon industry ranging from upstream to midstream and downstream.

Oil & Gas World Expo 2020 along with GASTech + Refining & Petrochemicals World Expo 2020 will provide a holistic platform to showcase latest trends in technologies, equipment & services to the right buyers from E&P, Natural Gas, LNG, CNG, CGD, Refining & Petrochemicals along with hydrocarbon infrastructure & services providing sectors.

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Email: conference@jasubhai.com<http://chemtech-online.com/oil-gas-world-expo-2020/about-event>**GASTECH 2020****Date:** 8-10 September 2020**Venue:** Singapore Expo, Singapore

Event: Singapore will provide a home for Gastech in 2020 that balances the truly international nature of our exhibitors, sponsors, delegates and attendees, whilst capitalising on the location's strategic importance as a hub for the growing Asian market. As the gas and LNG market experiences strong growth and change, there has never been a more important time for the community to come together, forge partnerships, do business and define the future of the industry.

Singapore is one of the most important energy and financial hubs in the world and an epicentre for trade across Asia. Singapore's major influence as a gas and LNG hub reflects the excitement and positivity driving growth in the region.

For details, contact:

DMG Events

Email: sales@gastechevent.com

Tel: +44 (0)203 615 5916

Web: <https://www.gastechevent.com/>**OPES 2020****Date:** 8-11 March 2020**Venue:** Oman Convention & Exhibition Centre Muscat, Oman

Event: OGWA is a biennial international exhibition and conference that brings together local and international oil and gas companies from the GCC, technology and service providers, equipment suppliers, and other companies directly serving the industry's requirements.

It is a platform for discussing the latest developments and directions of the industry, as well as for trade and business opportunities among the local and international oil and gas companies. Launched in 1998, it has since been under the patronage of the Ministry of Oil & Gas and has consistently received the support of Petroleum Development Oman (PDO), Oman LNG, and many other leading oil and gas companies.

For details, contact:

Ebrahim Taher Exhibition Director

OmanExpo

P.O. Box: 20, PC:117 Wadi Kabir 1st Floor, SABCO Building,

Wattayah, Muscat, Sultanate of Oman

Tel: +968 24660124 Fax: +968 24660125/126

Email: ebrahim.taher@omanexpo.com**ADIPEC 2020****Date:** 9-12 November 2020**Venue:** Abu Dhabi National Exhibition Center (ADNEC) Abu Dhabi, UAE

Event: ADIPEC is the world's largest and most influential event for the oil and gas industry and attracted a record breaking 155,000+ attendees in 2019, bringing together Energy Ministers, global CEOs and leading decision makers alongside the companies that shape the future of oil and gas supply across 4 days of focused business, dialogue and knowledge transfer that addresses today's energy needs and defines tomorrow's energy landscape.

ADIPEC gives 2,200+ exhibitors unparalleled access to the top decision-makers in the oil and gas industry and is the ideal platform to create new business opportunities, strengthen existing relationships and network across the entire energy sector, with an estimated \$17.99 Billion worth of business agreements taking place across the 4 days.

For details, contact:

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Oil and Gas Industry: Advanced Technologies

Editor: Jane Urry

Price: USD 80

Hardcover: 249 pages

Publisher: Callisto Reference

About the Book: The oil and gas industry is one of the largest and most advanced sectors of engineering. This book on the oil and gas industry discusses topics related to well logging, reservoir engineering and drilling. Recent developments in the field of oil and gas engineering or petroleum engineering are related to technologies concerning oil and gas recovery and extraction as well as improved computational methods for fluid dynamics. This book discusses the fundamentals as well as modern approaches of this field.



This book elucidates the concepts and innovative models around prospective developments with respect to the oil and gas sector. This text presents researches and studies performed by experts across the globe. This book, which is informed by the latest techniques that are available in oil and gas exploration and extraction, will be of great help to researchers in the fields of petroleum engineering, fluid dynamics and geology. The extensive content of this book on oil and gas industry provides the readers with a thorough understanding of the subject.

New Technologies in the Oil and Gas Industry

Editor: Jorge Salgado Gomes

Publisher: IntechOpen

Price: USD 140

About the Event: Oil and Gas are the most important non-renewable sources of energy. Exploring, producing and managing these resources in compliance with HSE standards are challenging tasks. New technologies, workflows and procedures have to be implemented.

This book deals with some of these themes and describes some of the advanced technologies related to the oil and gas industry from HSE to field management issues. Some new technologies for geo-modeling, transient well testing and digital rock physics are also introduced. There are many more technical topics to be addressed in future books. This book is aimed at researchers, petroleum engineers, geoscientists and people working within the petroleum industry.



Introduction To Petroleum Exploration And Engineering

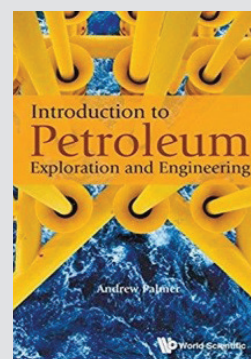
Author: Andrew Clennel Palmer

Price: Paperback \$38.00

No of pages: 154 pages (Paperback)

Publisher: WSPC

About the book: This book is an introduction to oil and gas designed to be both accessible to absolute beginners who know nothing about the subject, and at the same time interesting to people who work in one area (such as drilling or seismic exploration) and would like to know about other areas (such as production offshore, or how oil and gas were formed, or what can go wrong). It begins by discussing oil and gas in the broader context of human society, and goes on to examine what they consist of, how and where they were formed, how we find them, how we drill for them and how we measure them. It describes production onshore and offshore, and examines in detail some instructive mishaps, including some that are well known, such as Deepwater Horizon and Piper Alpha, and other lesser known incidents. It looks at recent developments, such as shale oil, and concludes with some speculation about the future. It includes many references for readers who would like to read further. Mathematical content is minimal.





Paint & Surface Coating

World Expo 2021

24-27 February 2021

Bombay Exhibition Center, Goregaon (East), Mumbai, India

Major Highlights

- Paint & Surface Coating World Expo & Conferences will be a comprehensive platform servicing the needs of every facade of the Paints, Coating & Surface Engineering industry right from raw materials, formulation, application, technology, finishing, quality assurance, recycling, disposal and end consumer.
- Innovation Pavilion showcasing latest developments by various Paint and Coating manufacturers, Raw Material manufacturers, Equipment and Tools manufacturers, Testing Equipments and Labs services etc.
- Green Pavilion showcasing Eco Friendly and Sustainable Paints & Coating Solutions.
- Emerging Technology Pavilion showcasing New Technology which will shape the future of Paint & Coating Industry in next decade.
- Pavilion on New Applications in Coating Industry & Surface Engineering.
- Product Presentation Lounge & Demo Zones.
- Two Days Technical Conference on Surface Engineering, Paints & Coating Industry.
- Over 20,000 Buyers from user Industry.

CONNECTING EXHIBITORS & THEIR BUYERS

Comprehensive platform servicing the needs of every facade of the Paints, Coating & Surface Engineering industry.

EXHIBITORS PROFILE

- Paint manufacturers and formulators for liquid and powder applications
- Manufacturers and distributors of paint raw materials for paints: Pigments, Additives, Resins, Solvents, Monomers, Bulk Chemicals & Intermediates, Specialty Chemicals, Stainers, Pigments Dispersions & Machine Colorants.
- Manufacturers of Pre-treatment and Corrosion prevention chemicals
- Manufacturers of Spray-guns and other paint application equipment
- Paint booths for OEM applications and quality assurance systems
- Decorative Paint Manufacturers
- Decorative Paint Applications Tools and Devices
- Paint Mixing, Conveying and Handling Systems
- Colour Matching Tools
- Dispensing Machines and Systems
- Manufacturing & Capital Equipment
- Analytical Instruments
- Testing Equipment
- Testing and Research Services

BUYERS PROFILE



- | | | |
|--|---|---|
| → Aerospace | → Chemical & Pharma | → Oil & Gas |
| → Architectural | → Construction Equipment & Heavy Duty Equipment | → Paint & Coating Manufacturers, Dealers & Distributors |
| → Agriculture Industry | → Food & Beverage | → Packaging |
| → Automotive OEM | → General Engineering | → Power & Thermal |
| → Automotive components | → Marine Coating | → Textile & Paper |
| → Automotive Refinish | → Metal Working | → Research & Environment Technology |
| → Building Segment – Residential, Commercial, Industrial | → Measuring & Test Technology | → Wood Coating |

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February 2022, Mumbai, India



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