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Toyo Engineering Corporation

Round Table Conference

Targeting Further Progress with Global Toyo

Four EPC Bases Supporting Global Toyo—Individual company status reports

Mr. Cho: In this round table conference, we would like to inform readers of Global Toyo's current status and future direction by reporting on the latest conditions at our EPC bases and our business strategies. To start with, would each of you please tell us about the lineup at your company and any major projects that are currently underway?

Mr. Osone: Toyo-India employs about 2,000 people. Approximately 1,000 of them are in the engineering division, giving us the largest team of engineers among the 11 Global Toyo companies.* As for our projects, we have a variety of major EPC projects that were won over the past three years and are heading towards completion. Specifically, an LNG terminal for Petronet LNG Limited and LNG processing facilities for Oil and Natural Gas Corporation Limited (ONGC) were constructed in 2009. The construction of an ethylene plant for Indian Oil Corporation Ltd. (IOCL) is scheduled for completion shortly. With the completion of these major projects, Toyo-India is focusing on sales activities to win new orders in the current fiscal year. We have successfully won four EPC projects from such clients as Mangalore Refinery & Petrochemicals Limited (MRPL). This pushes our orders for the fiscal year above the ¥40 billion level.

* Global Toyo companies: 11 companies located in Japan, Korea, China, Malaysia, India, Europe, the Middle East, and North and South America.

Mr. Nakao: Toyo-China has grown rapidly since it was established in 2004. We currently have approximately 450 staff members, of which about 130 are in the engineering division, and about 150 are project staff. Among our ongoing projects, we have a siloxane plant for Dow Corning Corporation, China (Zhangjiagang), and Integrated Petrochemical Site (IPS-II) project for BASF-YPC Company Limited, a joint venture of BASF Corporation, Germany, and China Petroleum & Chemical Corporation (SINOPEC). Since both of these global projects are being done on a cost reimbursable basis, we consider them to be trailblazing projects that indicate the future direction of Global Toyo.

Amid the financial concerns that emerged in fall 2008 and the ensuing economic turmoil, China and other Asian countries have been the quickest to find the road to recovery, becoming the driving force behind global economic recovery. For this issue of TOYO TIMES, we invited the presidents of our group companies in India, China, Korea, and Malaysia—Global Toyo's Engineering, Procurement, and Construction (EPC) bases—to talk about progress with developing Global Toyo.

From the left:
Kenjiro Miyashita (Toyo-Korea), Toji Kawakami (Toyo-Malaysia), Kiyoshi Nakao (Toyo-China), Hisashi Osone (Toyo-India)

Independently, Toyo-China won an order for a catalyst plant for an American chemical company in September 2009. We believe that this is an epoch-making project for Toyo-China because it is the first project in which we applied our position of "Sole foreign engineering company in China with licenses for all three EPC functions."

Mr. Kawakami: Toyo-Malaysia's team encompasses about 130 people. One feature of our operation is that our independent project ratio is the highest among TOYO's four Asian bases. In terms of our sales breakdown, approximately 50% is accounted for by the Malaysian national oil corporation Petroliam Nasional Berhad (PETRONAS). The remaining 50% comes from Japanese-related companies and European- and North American-related companies located in Malaysia. Among Japanese-related companies, we regularly receive orders for revamping and maintenance from a glass plant for electronic devices.

I have been in charge of the company for less than half a year. As the current fiscal year represents a slow period following the end of a major project, I am concentrating on developing new work, mainly targeting PETRONAS. On a different note, since Malaysia is a multiethnic nation, our workforce is a mixture of people of Malay, Chinese, and Indian descent. I have been keeping this feature in mind in our business operations.

Mr. Miyashita: Toyo-Korea has approximately 280 employees. The main point in which our business style differs from the other three bases is that our proportion of domestic business is small. Most of our business comes from working together with Toyo-Japan in providing

Chairperson
Juzan Cho
General Manager,
Corporate Planning &
Administration Unit,
Affiliate Administration
Division

Hisashi Osone

Managing Director,
Toyo Engineering India Ltd.

Profile

Mr. Osone entered the Company in 1977. After gaining experience of overseas sites in the Project Administration Division, he became involved in overseas sales in 1986. He was chiefly responsible for sales in the Asia area. In 1999, he became Manager at the India Office. In 2007, he was inaugurated Managing Director of Toyo Engineering India Ltd. Since 2009, he has served as Executive Officer of TOYO.

Kenjiro Miyashita

President and CEO,
Toyo Engineering Korea Limited

Profile

Mr. Miyashita entered the Company in 1977. Following that, he gained experience as a process engineer in the field of process design. He participated in a great number of ammonia and fertilizer projects throughout the world, in such places as Indonesia, China, and Pakistan. In 2004, he became General Manager of the Plant Engineering Center. He was inaugurated Vice President of Toyo-Korea in 2007, President and COO in 2008, and President and CEO in 2009.

engineering and procurement for Global Toyo projects. In addition, we are in the process of transferring engineering technologies for commodity production plants, such as Polyolefin (PE/PP), Styrene Acrylonitrile copolymer (SAN), and Acrylonitrile Butadiene Styrene resin (ABS) from Toyo-Japan to Toyo-Korea.

Within Global Toyo, Toyo-Korea has been given the responsibility of covering Indonesia and Russia. Currently, in Russia, we are implementing an Ethylbenzene (EB) production facility for SIBUR, a subsidiary of Gazprom. In Indonesia, we are working on a propylene expansion project for the national oil company PT PERTAMINA.

On the Front Line of Emerging Markets—Market expansion and business strategies

Mr. Cho: With the upturn in their economies, I think we can expect many new projects to come out of India, China, and Southeast Asia, including Malaysia. Would you share with us the business strategies of your four companies, which are on the front line of those markets?

Mr. Nakao: To date, TOYO has carried out more than 140 projects in China, most of which have been financed with indigenous capital. In recent years, however, in response to the Chinese government's open door policies, the number of investment projects being financed with foreign capital is increasing. With our high degree of engineering sense, engineering procedure, and engineering quality, Toyo-China has developed a business model that focuses on independently winning and implementing foreign-capital financed projects. Based on its past record, TOYO is well known and has a high reputation in China. Therefore, as long as the Chinese market remains a capital investment target for major companies worldwide, we will be expected to play a large role in that market.

Mr. Osone: Economic growth in India is forecast to be around 7% to 8%, the second-highest level in the world after China. Consequently, there is a robust market for plant and equipment investment. Expectations that India will be the driving force behind growth in Asia or in the world economy will likely continue for the time being. As such, the fact that Toyo-India has maintained its solid position in the Indian market is a significant advantage.

India's economic policies were isolationist at the start of the 1990s, until the government implemented its open door policy. In addition, there remained an administrative system inherited from the British colonial days, which left the Indian market governed by many regulations and stereotypical practices. However, in the last 10 years or so, the market has been converted to one based on competitive principles, and Indian companies have even begun efforts to become competitive in the global economy.

For some time, I have been proposing the importance of a "needs" driven way of thinking. Without doing an in-depth study of globalizing Indian companies, the government that supports them, and how to respond to those needs, we cannot be successful in India. Taking proactive approaches to cultivate clients' needs will become increasingly important in the future.

Mr. Kawakami: Our largest client at Toyo-Malaysia, PETRONAS, is aggressively proceeding with overseas development. We plan to use that fact as our angle for winning orders. In other areas, because Malaysia's population is growing, we believe projects related to food technologies and palm oil, which is the raw material for detergents and cooking oil, will increase.

I feel a change occurring in the relationship between headquarters and local subsidiaries among Japanese companies in Malaysia. In the past, local subsidiaries implemented headquarters' decisions. Recently, however, in many cases, the subsidiaries make their own decisions, including investment. Since Toyo-Malaysia is the largest Japanese engineering company within Malaysia, we plan to use that strength to expand our business among Japanese companies.

Mr. Miyashita: Toyo-Korea's team finds it difficult to take on extremely large projects independently. For that reason, I believe that Toyo-Korea's role within Global Toyo is to make full use of its mobility to take on projects that are in a region or of a size that Toyo-Japan doesn't usually deal with. Therefore, we look to markets like Russia or Indonesia for our projects.

However, that alone is not sufficient reason to set up a company in Korea. Consequently, since the latter part of 2008, we have started Chinese market entrance support for Korean companies. We actively provide services for Korean companies which handle textiles and chemicals and are developing in third countries such as China. For the domestic Korean market, we plan on pursuing eco-business, such as supplying companies with energy conservation technology. Since Toyo-Korea has the potential to contribute substantially to the business development of Korean companies, we are currently restructuring our strategies to fulfill that mission.

Mr. Cho: I see your companies are using market-oriented approaches that are well established in each of your markets to accurately capture business opportunities. Clearly we can expect that Global Toyo's network will also contribute to clients' ongoing projects.

Collaboration among Global Toyo Companies—Issues for further progress

Mr. Cho: Advancing Global Toyo is one of the basic policies of the Group's medium-term management plan. However, I think there are still very few Japanese engineering companies that have been successful as global enterprises. With that in mind, what direction do you think Global Toyo is going to take in the future?

Mr. Miyashita: When thinking of Global Toyo, I get an image of our various bases conducting satellite activities around the core of Toyo-Japan. For TOYO to become a truly global corporation, I think that the bases will have to expand and advance more horizontal cooperation. In terms of client needs, the four bases can collaborate in pursuing the optimum solution for the clients.

Cooperative relationships can be established. For example, if a Korean company is entering the Chinese market, the Front End Engineering Design (FEED) portion of project operations can be performed by Toyo-Korea, while the detailed engineering and construction can be executed by Toyo-China. In the IPS-II Project previously mentioned by Toyo-China's President Nakao, Toyo-Korea and Toyo-China are functioning as a single unit, providing a prime example of this type of relationship. The sharing of engineering standards and procedures through the infrastructure established among Global Toyo companies will provide the support for these collaborations. As these types of cooperative relationships become widely known among our clients, Global Toyo's presence in the engineering business market will expand.

Kiyoshi Nakao

Managing Director,
Toyo Engineering Corporation, China

Profile

Mr. Nakao entered the Company in 1977, and after gaining experience in Equipment Engineering, Overseas Projects/Proposals, became Manager of the Equipment Engineering Group in 1999. In 2004, he became General Manager, Overseas Sales and Operations Unit, Proposal Division, while concurrently serving as Executive Officer. In 2006, he became General Manager, Procurement Division, and in 2008 became Senior Executive Officer (current position). In 2009, he was inaugurated Managing Director of Toyo Engineering Corporation, China.

Toji Kawakami

Managing Director,
Toyo Engineering & Construction Sdn. Bhd.

Profile

Mr. Kawakami entered the Company in 1976. He gained experience at many overseas sites as a member of the Construction Division. In 2000, he became Group Manager, Overseas Business Unit, Industrial System Project Division, and in 2004 became General Manager, Domestic Sales and Operations Unit, Project No. 1 Department. In 2007, he became Deputy Division Director, Domestic Sales and Operations Unit, Plant Project Division. In 2009, he was inaugurated Managing Director of Toyo Engineering & Construction Sdn. Bhd. (Toyo-Malaysia).

Mr. Kawakami: At Toyo-Malaysia, we receive assistance from Global Toyo companies when there is a manpower shortage. I think that further expanding this cooperation among Global Toyo companies will require sharing resources, including manpower, as well as a standardization of engineering procedures. One more key element will be the active exchange of personnel. The experiences personnel undergo at other bases will no doubt lead to such thoughts as "We would like to have this as well," and "We want to do it this way too." I believe that personnel exchange will contribute to increasing employee motivation and provide a driving force for strengthening the overall power of each company.

Mr. Osone: If we consider what Global Toyo really represents, I think it would be the bringing together of special capabilities—cost, localization, and reliability of technology provided by the Toyo Brand—to achieve global power. A single base cannot provide all of these capabilities. It is achieved by the core, Toyo-Japan, and the individual worldwide bases contributing their strengths. Therefore, we have to be mutually aware of the strengths of each company and put them to good use. Using the power and resources of other bases to meet the needs of our clients will result in the creation of real global power.

Mr. Nakao: I believe Toyo-China's most important role within Global Toyo is procurement. In the past, Japan was a country that used its manufacturing power and skills to supply the world with high-quality products. That role was transferred to Korea about 20 years ago, resulting in the emergence of Korea-based engineering companies dominating the world market. Who will be next to take up this role? Clearly there is no country other than China. Over the past few years, China has demonstrated a dramatic improvement in manufacturing power and skills. Toyo-China's ability is to take advantage of this strength in applying it usefully to client services. Moreover, Toyo-China has a role everywhere. Whether the project is in India, Malaysia, or elsewhere, Toyo-China's major function within Global Toyo is to constantly supply price-competitive equipment, materials, and services. This role is also an important issue for Global Toyo's future.

Global Toyo and Using Close Relationships to Provide Clients with Value—Global Toyo's advantages

Mr. Cho: Internationalization of operations is ongoing at other companies as well. What do you think Global Toyo's special strengths and advantages are versus other engineering companies?

Mr. Osone: I think Global Toyo's strengths are proposal capabilities underpinned by foresight as well as execution capabilities that enable the realization of proposals. Take, for example, President Nakao's comment about procurement. What happens if we have a client company that would like to use Chinese-made materials and equipment, but can't seem to make up its mind? In such a case, we could show them how we would maximize procurement from China. At the same time, we could also propose that optimal engineering would still be achieved if we used some of our global resources. In other words, I think Global Toyo's greatest strength is the wide variety of options we can use to fulfill customer needs.

Mr. Miyashita: As I mentioned previously, in the past Toyo-Korea has supported Korean companies entering the Chinese market. In addition to providing support in completing the licenser's engineering package, Toyo-Korea handled EPC and portions relating to detailed engineering. That included meeting with our client's customer client, a Chinese petrochemical company, to explain on their behalf the special features of the process, or points of consideration regarding the engineering. In the case of an ABS resin manufacturing chemical company developing in the Chinese market, we were involved in negotiations with a Chinese engineering company. However, because we don't have an accurate understanding of the situation in the Chinese market, we asked for the cooperation of Toyo-China in that regard. Therefore, I think Global Toyo's strength is the ability to go beyond the boundaries of individual bases to create an optimum cooperative relationship.

Mr. Kawakami: I also see the rock-solid base of our cooperative framework as Global Toyo's competitive edge. Even in Malaysia, where Toyo Brand recognition is still low, Global Toyo's reputation for excellent EPC capabilities and high brand value is spreading steadily. For example, there was one project where there were only 130 days allowable for delivery. We knew we could procure through Toyo-China and borrow personnel from Global Toyo—Toyo-India

has a workforce of 2,000 people. The ability to say to the client that we could do it in 130 days gave us a great deal of confidence in making the proposal.

Mr. Nakao: My belief is that Global Toyo's major competitive advantage is our hand-in-hand relationship with customers. Whatever country the client wants to get into—China, India, or Southeast Asia—we have all the necessary on-the-ground experience and knowledge to get the project done. For this reason, we can properly meet the needs of our clients and guide them as the project proceeds. We can thank the strong footprint Global Toyo has built in each country and region through a wide range of projects for our ability to carry out these hand-in-hand activities with our clients.

Contributing to Society through Engineering—Being a trusted global company

Mr. Cho: Finally, I would like to bring up the subject of corporate social responsibility, or CSR. TOYO's group mission is "Engineering for the Sustainable Growth of the Global Community." By that we mean TOYO is committed to harmonizing the supply of energy and basic materials with requirements for environmental protection to contribute to the realization of a "Sustainable Global Community." In terms of CSR as well, we seek to fulfill our social responsibility through our engineering operations. I am sure that each of your companies is involved in CSR activities, such as communications with local communities or making contributions to society, in its own country. I'd like to ask you to tell us about your basic thinking and activities in this area.

Mr. Kawakami: Since Toyo-Malaysia is relatively small scale compared with the other bases, we don't have the luxury of implementing wide-ranging CSR activities. However, in the Kerteh region of Terengganu Province, where we have several business operations, we donate funds to schools, present them with supplies, and conduct safety education courses. In cooperation with Toyo-Japan, we accept Japanese university students and provide them with training opportunities, such as on-site experiences.

Mr. Miyashita: In Toyo-Korea's case, I think that our transferring of engineering technology from Japan to Korea is in itself a contribution to society. I think you all realize, from the strong presence of Korean engineering companies in the recent EPC market, that Korea's engineering skills are high. However, at the conceptual stage for formulating projects, we still can learn a lot from the experience and knowledge of Japanese companies. Moreover, in making those technology transfers or developing personnel, we do not focus on just giving them knowledge. We also share the experience, wisdom, and sense of values of TOYO. Although people change their jobs quite often in Korea, we don't mind. We feel that if people who have experienced Global Toyo's sense of values take that with them to another company, we are still contributing to building a "Sustainable Global Community" through them.

Mr. Osone: India's social system is complex. Because of the many cultures involved, perhaps Toyo-India has to consider different approaches than the other Global Toyo companies, even in CSR activities. While I think this is common in developing countries, there is a tendency in India to not take safety seriously. Against this backdrop, Toyo-India has started by focusing on hiring local staff and ensuring their safety. Our emphasis on safety makes a huge impression not only on the employees, but on their families as well.

In addition, I believe that by communicating our work attitude to employees, we are contributing in some way to the local community. In other words, we teach them that "the individual works for the group and the group works for the individual." This attitude is not limited to manufacturing. While working with local employees, we convey to them our views on training people and the process involved. We perceive these things as being very important contributions to society in India.

Mr. Nakao: At Toyo-China, our local CSR activities include such actions as donating computers to elementary schools and accepting trainees to learn our technologies. However, we should not stop there. I think it is important for all Global Toyo companies to share a common view of the issues involved in fulfilling our mission and social responsibility through our engineering operations in each region. As an engineering company and as a global company, our social responsibility must be supported by a higher awareness of the issues and strong execution capabilities.

Mr. Cho: Certainly, in developing further as a global corporation, it is important that we fulfill our social responsibilities in each of the regions we operate in. I want to thank all of you for joining this conference.

Petrochemical Project

Large-Scale Petrochemical Project Awarded by China's BASF-YPC

IPS-II project construction site

TOYO was awarded an order for an Integrated Petrochemical Site II (IPS-II) project petrochemical plant from BASF-YPC Company Limited. This client is a joint venture between BASF Corporation, Germany, and China Petroleum & Chemical Corporation (SINOPEC).

In 2002, BASF-YPC began operating the existing large-scale petrochemical complex (IPS-I) in Nanjing. The core of that complex is a 600,000 MTPA ethylene plant. The IPS-II Project will build or upgrade 16 process units to meet the growth in demand forecasted for the Chinese market. In addition, it will expand current utilities and off-site facilities.

A consortium of TOYO, Fluor Corporation, U.S.A., and Daelim Industrial Co., Ltd., Korea, is executing the project. TOYO is in charge of Engineering/Procurement service/Construction management (EPsCm) on a cost reimbursable basis.

Detailed engineering work by a Chinese engineering company is currently progressing, following the Front End Engineering Design (FEED) by Toyo-Japan and Toyo-Korea, while the equipment procurement orders surpassed 50% of the total amount. Construction work has started at the site, with the piling work finished at the end of January 2010. In addition, preparation for a revamping project at the next turn-around in April 2010, which includes piping prefabrication and building modification works, started in mid-January.

TOYO's safety and quality performance on the IPS-I Project resulted in the opportunity to work on the IPS-II Project. The Company will pay utmost attention to safety and quality, collaborating with the client and its partners toward completion in 2011.

Water Supply System

Study for Reformation of Ho Chi Minh City Municipal Water System Ongoing

The global water business market is forecasted to be worth ¥100 trillion in 2025, with operation and management services accounting for an extremely large share. In Japan, public bodies responsible for these services and private sector companies with world-leading technology in water treatment membrane filters and related areas are collaborating to enter the overseas water business market.

In cooperation with the Osaka Municipal Waterworks Bureau, the Kansai Economic Federation (Kankeiren), and Panasonic Environmental Systems & Engineering Co., Ltd., TOYO is undertaking an engineering study on high-efficiency water use and sustainable operation and management for the Ho Chi Minh City municipal water supply system in Vietnam. The study was commissioned by the New Energy and Industrial Technology Development Organization (NEDO).

With support from Kankeiren, the project combines TOYO's water treatment technology and extensive record with projects in Japan and overseas, the Osaka Municipal Waterworks Bureau's superior operation and management know-how, and Panasonic Environmental Systems & Engineering's renewable energy technology. This project represents Japan's first close collaboration between the public and private sector in this field to gain a foothold in the global water business, both in software (including business management) and hardware.

During the engineering study phase, TOYO and its partners will propose a pilot project that will lead into the project's next phase. If the proposal is accepted, the pilot project will enter the validation stage.

Water treatment plant inspection

Entrance Support

Providing Support for Japanese Corporations with Chinese Market Entrance Projects

TOYO has performed more than 50 successful Chinese market entrance projects for Japanese corporations since 1994. Interest in entering the Chinese market remains high among Japanese corporations. Here we will introduce two projects that TOYO was awarded in 2009.

Polycarbonate Production Facilities

TOYO was awarded a polycarbonate resin production facilities project. The facilities will have an annual capacity of 80,000 tons, and will be built in China's Shanghai Chemical Industry Park by Mitsubishi Gas Chemical Company, Inc., and Mitsubishi Engineering-Plastics Corporation. Construction of the facilities is scheduled to commence in spring of 2010, and production is scheduled to come on stream in 2012. The client's total investment in the polycarbonate resin complex project is anticipated to be approximately ¥30 billion.

Nutritional Feed Additive Production Facilities

TOYO received a project for a facility that will produce a nutritional feed additive called Methionine. The facility will have an annual capacity of 20,000 tons, and will be constructed in China's Dalian Development Area by Sumitomo Chemical Co., Ltd., and Dalian Jingang Group Co., Ltd. The new facility will be built as an investment to meet increased need

Ground breaking ceremony for polycarbonate production facilities

for Methionine. That need stems from growing demand for meat due to both the increase in the global population and economic growth in emerging countries. The construction of this facility in China is a strategic measure being taken by Sumitomo Chemicals to strengthen its position in the life sciences field.

TOYO was awarded the above new projects because of its record of working on more than 140 projects in China. Another factor was TOYO's strong reputation as a partner that can contribute to clients' needs in terms of cost, quality, construction, and other project factors based on its abundant experience assisting Japanese companies enter the Chinese market. Going forward, TOYO intends to aggressively seek more projects by Japanese companies entering this market.

LLDPE Plant

TOYO Completes LLDPE Plant in Thailand

In cooperation with Toyo-Thai, TOYO completed a Linear Low-Density Polyethylene (LLDPE) plant for PTT Polyethylene Company Ltd. (PTTPE). This 400,000 ton annual capacity plant was built in Rayong, Thailand. It was a downstream project of a 1,000,000 tons per year ethylene plant that was also jointly awarded to TOYO and Toyo-Thai.

TOYO has worked on many UNIPOL Polyethylene (PE) Process plant projects around the world. With one of the world's largest reactors in one train, feedback from TOYO's past experiences was leveraged throughout project implementation.

Toyo-Thai was responsible for the main role in project execution, including detailed engineering, procurement of equipment and materials, and construction. Under the Global Toyo structure, Toyo-Korea also contributed to the project by carrying out FEED, procuring some of the major


Completed LLDPE plant

equipment, and assisting with commissioning. The Global Toyo companies fully demonstrated their overall capabilities as a team by effectively using their individual skills, providing the driving force behind the success of the project. The project experienced a smooth startup, and brought full-scale production on stream.

Monosilane Plant

Monosilane Plant Project in Progress—Demand for solar cells expanding

Ground breaking ceremony for Monosilane Plant Project

In June 2009, TOYO was awarded the Monosilane Plant Project by Evonik Monosilane Japan Co., Ltd. (EMJ), a Japanese group company of the Evonik Industries AG Group of Germany. With this project, EMJ plans to construct a plant that will produce approximately 1,000 tons of monosilane gas annually in Yokkaichi, Mie Prefecture, Japan.

Monosilane is an industrial gas that is used to form silicon films for thin-film silicon solar cells and a variety of electronic devices in the semiconductor industry. Rapid growth is continuing in the solar power field, with the world market for monosilane expected to grow at an annual average rate of 20% from now until 2020. This growth is being driven by current calls for CO2 emission reductions and requests for environmentally conscious energy sources. As the new plant is the first monosilane facility that Evonik will build outside Europe, this project will constitute a significant part of the global strategies of Evonik aimed at worldwide energy efficiency.

In 2008, TOYO performed support services for the basic design of the new plant, and at present is taking charge of engineering, procurement, and construction (EPC). On November 24, 2009, there was a ground breaking ceremony at the construction site, and Evonik and TOYO welcomed the mayor of Yokkaichi city, Mie Prefecture, to this ceremony. Aiming to further increase the sense of unity with the client, TOYO is working to achieve the delivery date by commencing plant operations in 2011.

Gas Processing Project

Project Completion Ceremony Held for World-Class Natural Gas Processing Project

On December 13, 2009, Petropars Ltd. hosted a project completion ceremony for new world-class natural gas processing facilities in the main hall of Milad Tower, a 400-meter high communications tower in central Tehran, Iran. The client held the ceremony to celebrate the safe handover of all facilities of the South Pars 6th, 7th, and 8th gas field project to the end user, Pars Oil & Gas Company.

The ceremony was conducted on a grand scale, attended by more than 800 people invited from Iran's Presidential Office, parliament, local companies, and related government agencies, as well as international and national oil companies from around the world. As the leader of the joint venture, TOYO was at the top of the long invitation list. The venture also included JGC Corporation, Japan, the Industrial Development and Renovation Organization (IDRO), Iran, and Daelim Industrial Co., Ltd., Korea. TOYO president and CEO Yutaka Yamada received, at the beginning of a long award list, a letter of appreciation for the project performance and TOYO's contributions.

The new facilities process a total of 3,900 MMSCFD of natural gas from the 6th, 7th, and 8th mining areas of the South Pars Gas Field, 100 kilometers offshore from Iran. The gas will be processed at facilities in the Bandar Assaluyeh section of the South Iran and Persian Gulf industrial districts. As a single gas processing facility, its scale is one of the largest in the world.

The completion of this significant project is expected to provide Asia with stable energy supplies. TOYO strives to contribute to further projects in the natural resource rich Middle East region.


Project completion ceremony for the South Pars 6th, 7th, and 8th gas field project

ETBE Plant

TOYO Completes ETBE Plant for Nippon Petroleum Refining

TOYO has completed Japan's first commercial Ethyl Tertiary Butyl Ether (ETBE) plant for major Japanese energy company Nippon Petroleum Refining Co., Ltd. The plant was completed on schedule without lost time incidents, and commercial production began in January 2010.

ETBE is synthesized from plant-derived bioethanol and petroleum-derived isobutene, and is blended with regular gasoline to produce biogasoline. As a global warming countermeasure, the Japanese oil industry has set a target of supplying 800,000 kiloliters of ETBE to the market in fiscal 2010, including imports. The industry plans to sell the crude oil equivalent of 210,000 kiloliters of biogasoline in Japan in the same fiscal year.

With those goals in mind, Nippon Petroleum Refining started a breakthrough project to renovate its current MTBE* manufacturing facilities. The facilities produce ETBE using bioethanol manufactured from substandard Japanese wheat and sugar beets. TOYO won the order for the engineering and construction work.


Completed ETBE plant

The completion of these manufacturing facilities enables Japan to produce biogasoline on its own. This achievement boosts Japan's energy self-sufficiency in obtaining stable supplies of biogasoline, a major goal related to reducing Japan's carbon footprint.

With the completion of this significant project, TOYO strives to contribute further to reducing environmental impact by building new facilities and revamping others.

* Methyl Tertiary Butyl Ether (MTBE): A gasoline additive made from natural-gas-derived methanol and isobutene.

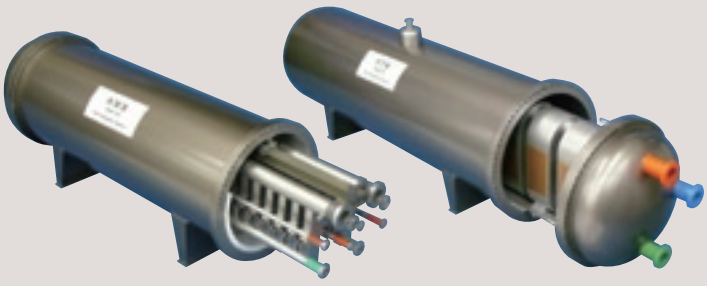
Micro GTL Process Development

Micro GTL Moves into Pilot Plant Phase

Since November 2007, TOYO, MODEC, Inc., and Velocys Inc. have been collaborating on the development of a compact Gas to Liquids (GTL) process using microchannel reactor technology. The fundamental technology development is almost complete. The project is now moving into the pilot plant test phase, the final phase for commercialization. With the cooperation of Petróleo Brasileiro S.A. (PETROBRAS), the pilot plant will be built in a refinery in Brazil. The companies aim to complete construction by the beginning of 2011 and, after verifying various required data through several months of trial runs, expect to be ready for commercialization by the end of the same year.

Microchannel reactors achieve a dramatic improvement in overall reaction efficiency by providing a small space for reaction sites. As a result, this revolutionary technology enables highly compact reactors, reducing the size of the equipment to about one-tenth the conventional size. As shown in the picture, the reactors can fit into a horizontal vessel. Velocys provided the key concepts for the microchannel reactors. Kobe Steel, Ltd., cooperated in the reactors' manufacturing.

Microchannel reactors achieve Steam Methane Reforming (SMR) and a Fischer-Tropsch Reaction (FTR). These are the two major chemical reactions of the GTL process. This new technology greatly simplifies the GTL process and makes conventional large scale facilities more compact and lightweight. It also allows TOYO to provide clients with a new method for utilizing associated gas from oil fields or gas from small- and medium-sized gas fields as liquid fuel. In addition, a plant taking advantage of the compact, lightweight features of this technology could easily be fitted on a ship. TOYO is working on developing this market in collaboration with MODEC.


Steam Methane Reforming (SMR) reactor vessel

Fischer-Tropsch Reaction (FTR) reactor vessel

【1/20 scale model】

IN ACTION

Toyo-India Awarded 5 Major Projects by Indian National Oil Companies

Recently, Toyo-India was awarded 4 EPC projects and 1 Project Management Consulting (PMC) service project by Indian national oil companies. With these orders, Toyo-India has surpassed its new orders target for this fiscal year.

The projects are:

- >>> **Diesel hydrotreating project for Hindustan Petroleum Corporation Limited (HPCL) in Mumbai**
- >>> **Crude/vacuum distillation unit revamp project for Mangalore Refinery & Petrochemicals Limited (MRPL) in Mangalore**
- >>> **Delayed coker unit (balance of plant) including LPG treating unit for MRPL, for phase III expansion in Mangalore**
- >>> **Hydrogen generation unit for Chennai Petroleum Corporation Limited in Chennai**
- >>> **Delayed coker unit including coke handling facility for Indian Oil Corporation Ltd. (IOCL) in Paradip**

In line with sustained economic development in India, it has become necessary to enact an environmental countermeasure against vehicle emissions. This standard, Bharat Stage IV, will come into effect in major Indian cities starting in April 2010. Consequently, both newly established and existing refineries will be required to keep pace with upgraded product specifications and the processing of a variety of raw materials. Toyo-India continues to aggressively engage in further activities aimed at achieving the new target of environmental responsiveness.

Previously, Toyo-India completed large-scale projects, including: $C_2/C_3/C_4$ extraction for Oil and Natural Gas Corporation Limited (ONGC), Dahej; an LNG regasification terminal for Petronet LNG Ltd. (PLL), Dahej; and a motor spirit quality upgradation project for IOCL, Panipat. The company is presently executing a naphtha cracker unit project in Panipat and a residue upgradation project in Baroda for IOCL.

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