Insight!

MPRL E&P

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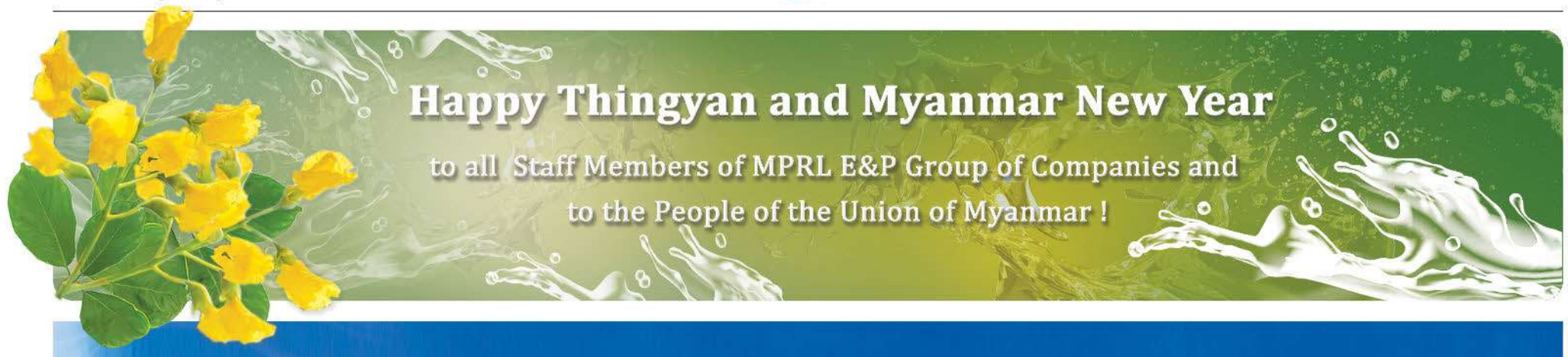

BLOCK A-6 GAS DEVELOPMENT PROJECT AND ITS BENEFITS TO THE COUNTRY

U Moe Myint – Chairman & Chief Executive

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The Environmental Impact Assessment ("EIA") Process in MPRL E&P

HSE Team

What is the purpose of an Environmental Impact Assessment or EIA?

According to words of Wikipedia, an EIA is a public assessment to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. Environment has to be understood in its broadest sense, natural as well as social. An EIA is the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. EIA's require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts. An EIA is therefore as good as the proponent of the project is transparent and open by inducing the concerned public to participate. In the case of this paper, MOGE as the operator of the Mann Feld and MPRL E&P as its contractor are the proponents of the EIA on the Mann Field's operations.

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Insight!

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Your Opinion : Which is more Important, Talent or Hard Work?

Min Zaw Oo
Assistant Geoscientist, Geoscience Department

In my book, talent is an inherent quality of an individual who has been gifted by nature. People who are said to have talent are people who have achieved impressively in their particular area of interest in life. Therefore, such an individual with a particular talent can thrive in certain fields that involve using one's natural gift or in specific industries where new ideas and innovation are important. We can see talent is more important in creative fields, for example in careers like arts and sports, followed then by time put in and hard work. However, talent is not the whole story and talent alone cannot bring success without the virtues of determination and perseverance.

Talent is a natural sort of gift for a particular thing, and unfortunately, not everyone is endowed with it. Nevertheless, there are ways to build and grow it if one is eager to learn new knowledge, skills and self-discipline. Sometimes it is not unusual to see determination, commitment, persistence and hard work turn an ordinary person into a talented one.

I have read a few biographies of contemporary personalities in business, entertainment, education, sports and arts, and I realised self-learning, desire, hard work and experience brought many of them triumph in their careers and lives. The most well-known example is Thomas Alva Edison who invented a light bulb in 1879 after studying many books on electrical techniques and after having repeated failures. In the same way, we should rise up every time we fail in life without giving up, just like Edison.

In addition, to succeed in life, one should love their job, think carefully before doing anything, maintain morals and ethical values, and engage in a job persistently and for a long period of time. I believe these simple tips will help us all achieve success in life and our careers if we put them into practice wholeheartedly. ■

Mya Thandar Aung
JV Business Assistant, EJV Department

When someone is born talented they are seen as having the potential to be successful, but this talent becomes wasted without the addition of hard work because people need to practice to improve; the risk of not having practice is losing the talent one might have. On average, those who have more practice perform at a much higher level than those with little practice, and the harder someone works, the better they become.

When a student or any person wants to achieve something, they need to work hard on what they want and focus on the goal and they will see results by merely having worked hard on their goals. Therefore, talent may give you a head start, but hard work makes you finish the race. As children we have all heard the story of "The Tortoise and The Hare". A slow tortoise is tired of getting picked on by a fast rabbit so he challenges him to a race. Halfway through the race the rabbit takes a nap because he believes in his talent assuming he has so much time before the tortoise finishes. However, the rabbit sleeps too long and the tortoise, moving at his slow and steady pace, wins the race. This is a great children's story with many lessons, with the most important in my opinion, that hard work will produce results, and that good things take time.

You might have talent in some fields but if you do not practice consistently, you may not be able to perform well. This is why even naturally talented athletes put hours and hours of effort into practice to better themselves. For example, The Water Festival Burmese girls can exhibit a great talent for traditional Burmese dancing but without good teachers to guide their raw talent and the girls' perseverance in practicing and honing their talent, the dancers would still just be average dancers. Only with the help and guidance of their teachers, the girls can perform the traditional dance well during Water Festival. Therefore, nobody is born perfect at something, and there is always potential for people to work hard and succeed.

In conclusion, talent and hard work together can help any person to succeed, and that success can actually be more durable as "practice makes perfect". ■

MPRL E&P Organized Women's Empowerment Sewing Training for Mann Field Communities

Thae Aei Khinn Zaw

On February 15th, MPRL E&P initiated the 4th vocational sewing training for Mann Field Communities with the aim of women's empowerment through self-reliance and financial independence, which can lead to either them running their own business or taking up a job. The art of tailoring is the kind of job which women can learn at a fast pace if they learn with sheer interest and they can immediately start the job right from their homes upon completion of the course.

The opening ceremony of the women's empowerment sewing training was held at Dhammayone of Aye Mya village on 15th February and it was attended by U Moe Zaw Tint, Field Operations Manager, U Ye Naing, MOGE General Manager, Village Development Committees, Village Administrators, Community Volunteers and the CSR Field Team. There were altogether 20 female trainees for sewing training.

Opening Speeches were given by MOGE GM (Mann), Designer and U Moe Zaw Tint, Field Operations Manager.

The women's empowerment sewing training will last for a month and it is highly anticipated that the trainees who attend this training will be able to start their own business or get a job and stand independently as a professional skillful tailor in the future. During the training, the 20 trainees were taught by the proficient designer and tailor using famous centimeter and millimeter methods both practically and theoretically. The teaching hours of this training will be 300 hours for a month.

The main objective of MPRL E&P in organizing the vocational skills training is to improve the livelihoods of the local communities in Mann Field by helping them achieve self-reliance. Bearing that in mind, MPRL E&P managed to organize and facilitate four vocational skill trainings during the fiscal year 2017-2018. ■

Youth, Skill and Education Fair Highlighted Relationship between Skill and Employment

Thal Sandy Tun

A Youth, Skill and Education Fair in Magwe on 13th December 2017 was observed by over 2,000 people, including the CSR Field Team in Mann Field. The fair, which took place at city hall, aimed to offer both employment opportunities and occupational training opportunities for youth in Magwe Region.

Minister for Planning and Finance U Zaw Lwin gave an opening speech at the fair and said more of such events will occur consecutively from this year to 2021 in an effort to emphasize the connection between skill and employment.

Representatives from HELVETAS Myanmar, which is an organisation working in the central dry zone under a Memorandum of Understanding with the Department of Rural Development since 2012, explained that they focus on skill development of rural youth in the region in cooperation with private businesses, public sectors and CSOs. They intend to open short-term practical training courses on construction skills and mechanical and tailoring skills, based on the high availability of jobs in such sectors.

Youth groups discussed difficulties they face in acquiring training and a job. Experts also discussed that there is more of a youth population in Magwe Region according to national census. However, there are fewer job opportunities in comparison and the pay is low too. To improve the situation, there is a need to accelerate governmental support and cooperation with SMEs. Similarly, young people should be aware that they need to develop multiple skills such as computer skills, and job-specific and interpersonal skills such as team work to be successful in their job hunt. Greater participation and opportunities for women and disabled people in training and employment were also stressed by experts.

Daw Zin Mar Myint, CSR Field Coordinator, who attended the fair, said, "I had a great time listening to the discussion of experts, government officials, CSOs and the youth themselves together in one place. We too have been providing vocational skill training to communities in Mann Field in order to help them create an income on their own scale. Through this fair, I can share ideas with my colleagues, for example, the kind of vocational courses we can develop in Mann Field in the future with a focus on young people." ■

MPRL E&P Employee Completed 42.195 KM Challenge in YOMA International Marathon 2018

Thal Sandy Tun

On January 21st 2018, 30 employees from MPRL E&P took part in the YOMA International Marathon, Yangon's largest running event with over 8,000 runners. U Kyaw Zin Oo, Asst. Geoscientist, was one of the participants and was the only participant sponsored by the company for the 42 kilometers challenge. He finished his challenge extraordinarily well given the fact that it took six and a half hours of continuous running from five in the morning.

U Kyaw Zin Oo talks to the Insight! Team about his experience with the race, his physical and mental preparation to embark on the challenge and his passion for running!

Q: How long did it take to complete your race from start to end? How did you feel about your accomplishment?

A: The stipulated cut-off time for 42.195 km full marathon was 6 1/2 hours and the flag-off time was at 5:00 AM. Therefore, full-marathon runners had to cross the finish line by 11:30 AM to successfully complete the race. I took 5 hours 01 minutes and 49 seconds to complete it. A total of 228 marathoners participated in the race and 200 runners finished within the cut-off time; I was the 92nd finisher out of 200. I'm proud to have accomplished this tough race for the very first time.

Q: How did you prepare for the challenge both physically and mentally?

A: The preparation is a vital part to accomplish any type of work. The veteran marathoners said that "If you're a newbie marathoner, you should run about 5 km at a time and need to plan for training for about six months before a race". I therefore prepared and trained nearly six months before the full marathon; this was helped by the unique experience of having

to complete a 20-mile long race as part of the conditions to gain university entrance for Geology major in 2008. In fact, mental preparation is more difficult than physical preparation if you don't have a definite reason and good supporters for the race. My reason was "to boost-up self-confidence levels and push my limits" and I had good supporters in my beloved ones.

Q: Was it the first time you had taken part in a 42.195 km challenge in the YOMA International Marathon? Are you a regular runner?

A: Yes, it was the very first time for me to run a 42.195 km race in the YOMA International Marathon. However, it was also the third time I participated in the YOMA International Marathon. I've run 10 km in 2016 (challenge), 21 km in 2017 (half-marathon) and now 42.195 km in 2018 (full marathon). I go running every weekend for about 20 km or 3 hours, so yes, I am a regular runner. Moreover, I walk back home 3.5 km every day from the office without taking a ferry or a bus.

Q: What is this running thing? What does it mean to you?

A: In my vision, it takes courage to sign up for a first full marathon and completing this race is an interesting objective for a strong-minded person who wants to expand his/her comfort zone for undertaking heavy tasks at a crucial moment. That motivated me to run this full marathon. Running calms down my mind, brings me new ideas, and improves my health. Running is my "go-to sport", it helps me to find solutions to my problems and inspires me to have new ideas.

In fact, while a full marathon is a very short distance compared to your entire life, and while they have different difficulties, they present the same sort of challenges within their limits. In this race, I had to try hard if I wanted to overtake others; when I rested for a second, others overtook me. This leads to reflecting on our daily life. We have to try our entire life to overcome many kinds of challenges. In our life, we are definitely behind the others on the day we stop trying. This is one of the things I have learned from this marathon.

Also, my confidence level significantly increased after I completed this race, and I do not worry about a full marathon anymore, because I have done it well and believe that I can do more. The self-confidence and motivation from this successful accomplishment drives me to overcome any difficulty in my daily life, and not just for running. This is the second most valuable teaching that I've got from this full marathon, that "I can overcome any difficulty in my future and I am ready for it". I would like to encourage all of you to participate together in the next YOMA International Marathon 2019 and let's train to run, run and run! ■

MPRL E&P Successfully Submitted the 2018 UNGC Communication on Progress Report for the Second Time as a Signatory Member

Thae Aei Khinn Zaw

The United Nations Global Compact is a call to companies everywhere to voluntarily align their operations and strategies with ten universally accepted principles in the areas of human rights, labor, environment and anti-corruption, and to take action in support of UN goals, including the 17 Sustainable Development Goals, which can provide a historic opportunity to unite all global stakeholders to end extreme poverty, fight inequality and injustice and to protect our planet.

The UN Global Compact is a leadership platform for the development, implementation and disclosure of responsible corporate policies and practices. Launched in 2000, it is the largest corporate responsibility initiative in the world, with over 10,000 signatories based in 140 countries.

MPRL E&P became a signatory of the United Nations Global Compact since February 2016. In a 2016 UNGC report, the core management system and the integrity of leading a responsible business were presented in line with ten UN Guiding principles. Becoming a UNGC member in 2016 and submission of our first COP in 2017 was a significant milestone and MPRL E&P takes great pride in renewing our commitment to the UNGC and to the implementation of its Ten Principles.

In this 2018 UNGC Communication on Progress Report, we portrayed results based performance and sustainable development across the company's activities in accordance with the Ten Principles as well as 17 Sustainable Development Goals. MPRL E&P has many benefits in submitting UNGC Communications on Progress Report as those 17 Sustainable Development Goals can help us shape the path of our business operations, transparently communicate with all stakeholders and report on our defined strategies, goals and initiatives. After being a signatory member for a year, there have been significant improvements in our actions, efforts and performance with all of our stakeholders using our primary channels of communication. ■

OUR COMMUNITY

Lay Eain Tan Village

Zin Mar Myint

Lay Eain Tan is one of the surrounding communities located in the east of Mann Field and in the west of Ayeyarwaddy River. The main livelihoods of the village are different types of agricultural activities.

As Lay Eain Tan is located near Mann Field, it benefits from the CSR activities of MPRL E&P which address their basic needs or impacts from operational activities.

In order to promote easy and round the clock access to water, a water pipeline was set up in the village in November 2014 through the support of MPRL E&P worth MMK 1,257,900. In August 2017, a water filtration unit which cost the company MMK 2,676,720 was also installed in the village school as the most efficient method to increase access to clean drinking water for students.

In addition, members of the community have participated in the vocational trainings provided

by MPRL E&P during this fiscal year, namely Value-added Food Products Making Training (Jams and Fruit Juices), Soap Making Training, and Pigeon Pea Value-added Food Products Making Training. These trainings intend to provide the local people with an opportunity to create an additional income as well as pave the way for developing SMEs to drive regional economic growth. Following the completion of these trainings, some of the participants have already successfully started their own business of manufacturing shampoos, detergents and soaps using natural ingredients and selling them all up in their neighborhoods.

All these CSR activities came to fruition through the coordination and cooperation of the Village Development Committee and the village people. This is one of the lessons learned, as well as being a CSR best practice in Mann Field.

Ko Kyaw Kyaw Naing, Community Volunteer
Lay Eain Tan Village

Ko Kyaw Kyaw Naing is a 30-year-old community volunteer from Lay Eain Tan village. Having a local education up to grade 11, his main occupation is agriculture and he provides his service to his village for free in his able time. He was selected as a community volunteer at the end of 2013. He is interested in and passionate about the development of his community. It is also in his element to work with other people and organizations.

He has contributed to a number of CSR activities including but are not limited to vocational trainings, Operational Grievance Mechanism, and engagement events. He articulates his role and the importance of CSR activities for local development.

"It is good that I have a chance to participate in these activities myself as it makes me feel a sense of ownership as well as satisfaction. Now I feel more informed and experienced than before. I think my capacity to take initiatives on my own as well as work together with people have been elevated to a higher level over the past few years. For me, local development is always the number one. Only when we are developed, in terms of both infrastructure and knowledge, will we be changed for the better. MPRL E&P's CSR activities address the priority areas for development carefully identified by the community where our fundamental needs are met without fail. " ■

Asia's Premier Offshore Energy Event held in KL

Thal Sandy Tun

The biennial Offshore Technology Conference Asia was held in Kuala Lumpur, Malaysia from 20th to 23rd March to highlight an Asia that has been coping with the challenges of volatile global oil prices, and as a hub for innovative technology and cost-effective solutions.

Aimed to look into what it takes to remain resilient and responsive to a dynamic and sustainable energy market in the region, the conference hosted more than 25,000 participants from over 70 countries, around 450 thought leaders and technical expert speakers, 70 conference sessions with 350 technical papers, and over 270 sponsoring and exhibiting organisations.

Representing MPRL E&P, Country Manager U Sithu Moe Myint attended the conference and presented the history & outlook for Myanmar Block A-6 Ultra - deepwater Exploration and Development Project during the Myanmar Country Session, which took place on March 23rd March. Other speakers in the session included Myanmar Country Managers of PTTEP, Petronas Carigali, Schlumberger and Total E&P.

The theme of the OTC Asia 2018 was 'Excellence in Asia', and some of the highlights of the conference were the Next Wave, a program for young professionals, the High School Student STEM program for high school math and science students, Distinguished Achievement Awards for major technological, humanitarian, environmental and leadership contributions to the offshore energy industry, and the University R&D Showcase and Challenge program.

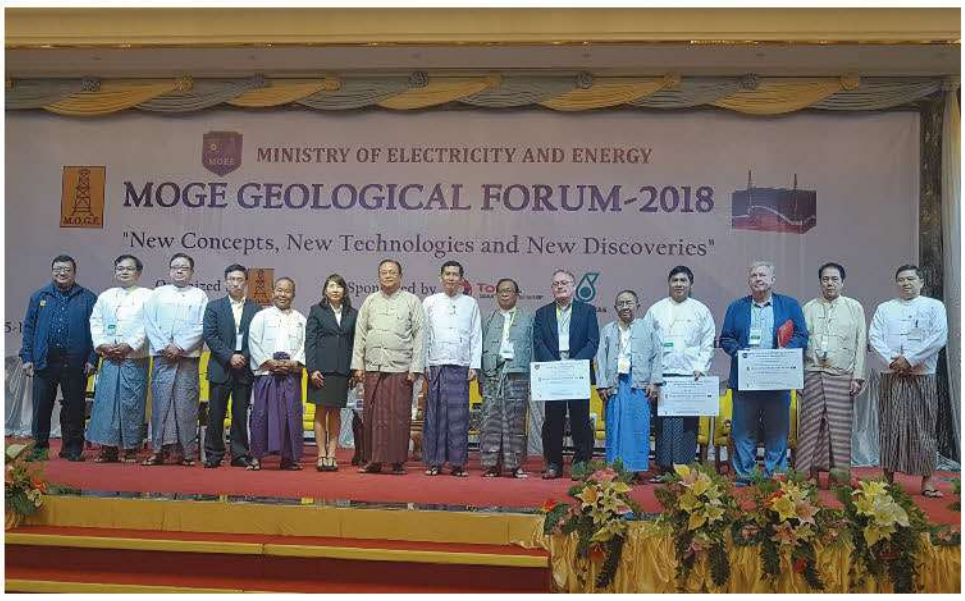
The Offshore Technology Conference (OTC) is an occasion where energy experts and professionals meet to exchange ideas and opinions for advancing scientific and technical knowledge regarding offshore resources and environmental matters. Established in 1969, OTC's flagship event is held on a yearly basis in Houston. OTC has grown both technically and globally with the Arctic Technology Conference, OTC Brazil, and OTC Asia. ■

Site Visit of Bangkok Bank Ltd. (BBL) to Myint & Associates Offshore Supply Base Ltd. (M&AOSB) - 22nd ~ 23rd March 2018

MOGE Geological Forum 2018 Paving the Way Forward

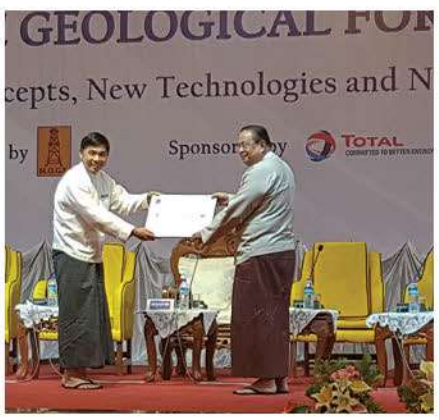
Thal Sandy Tun

A two-day forum with the theme of 'new concepts, new technologies and new discoveries' was organised by MOGE (Myanmar Oil and Gas Enterprise) in Nay Pyi Taw from the 15th to 16th of March. Given that onshore exploration activities and hydrocarbon discovery in Myanmar have been noticeably limited due to the long period of depressed oil prices, the forum provided an opportunity between MOGE, experts, professionals and private operators to come together and share their experiences and knowledge to promote a better understanding of Myanmar geology and open up possibilities for new discoveries in the near future.



The forum saw attendance of about 300 people which included Union Minister for Ministry of Electricity and Energy U Win Khine, MOGE officials, university representatives, international oil and gas companies operating in the country, service companies' representatives and independent professional geoscience bodies. MPRL E&P's Technical Team consisting of 17 geologists and engineers was one of the participants as a professional geoscience team, and U Kyaw Zin Oo, Assistant Geoscientist made a presentation titled 'Evidence of currents in outcrops of Pliocene Ayeyarwaddy River and implication for sand distribution in deep waters west of the Myanmar Coast' while U Ko Ko, Technical Manager, served as a panelist in the panel discussion.

U Kyaw Zin Oo shared his very first experience of reading a paper in his professional life at the forum. He reflected, "My research is concerned with a new concept of reservoir sand distribution in the west coast of offshore blocks A-6 and A-7. This was my first time presenting a paper and as the research was a new concept, naturally there was a division among the audience – people who support it and those who remain dubious. I accepted this as a positive step – in triumph. At the end of the paper I received congratulatory messages from my admired geology guru Dr. Claude Rangin, and the audience as a promising new generation from MPRL E&P which made my day. This achievement would not happen without the massive support I gained from my team members. I would like to thank them all and Senior Management for this great opportunity."



U Kyaw Soe Win, Geoscience Manager also said "By attending this valuable forum we achieved a dual purpose of giving our young technical staff an exposure to an international conference while successfully rolling out a new concept of offshore reservoir deposition system in the forum by one of our hard-working geologists. In addition, we were able to obtain the most recent information from MOGE and international oil and gas companies (IOCs) operating in the country. It is important that we maintain our relationship with our key stakeholders such as MOGE and business partners through such an event."■

Looking Back and Looking Forward : Reflection Workshops held at Mann Field

Thae Aei Khinn Zaw

On 22nd and 23rd March, CSR & Communications Team had year-end Reflection Workshops at Mann Field with MOGE (Mann), Village Administration, Village Development Committees and Community-based Volunteers as well as the CSR Field Team at Mann Field. The purpose of having Reflection Workshops at Mann Field is that we would like to evaluate and have a chance to look at what we've achieved together in the fiscal year 2017-2018 and more importantly, look forward to our interesting and exciting plans for fiscal year 2018-2019. During the workshops, the CSR activities undertaken throughout the fiscal year 2017-2018 were discussed and the feedbacks and improvements were provided. Some new and good suggestions were received regarding coming fiscal year CSR activities based on the need assessment that has been done early this year.

There were altogether 23 participants from MOGE (Mann), 42 participants from Village Administration and Village Development Committees, 12 Volunteers from 14 communities and 2 CSR Field Staff. By having the Reflection Workshop to review CSR initiatives, efforts, achievements, and implementations we came to understand the main challenges faced in this fiscal year, which enables us to effectively coordinate in better and more efficient techniques for planning and implementing the fiscal year 2018-2019 CSR work programs with all stakeholders, who are directly or indirectly involved with the operations of the business of MPRL E&P.■

MEITI Can Help Build Lasting Trust and Peace

Myo Zaw Oo

U Myo Zaw Oo, Senior Stakeholder Engagement Officer provides an update on MPRL E&P's participation in Myanmar Extractive Industries Transparency Initiative, MEITI, as a member in the Multi-Stakeholder Group, and the progresses and challenges faced in the reform effort.

EITI, or Extractive Industries Transparency Initiative is a global standard for governments in resource-rich countries to improve resource governance by managing income from natural resources with transparency and accountability. In order for current reforms being implemented in Myanmar to be successful, a framework on economic and social reforms was adopted. In the areas of governance and transparency reforms, MEITI is one of the most important strategic initiatives Myanmar governments have made.

Ideally national income from natural resources and expenditures should be disclosed to the public which will enhance the ability to choose the most practical projects appropriate for local communities and to nurture sustainable development. In addition, the practice will also improve transparency of private enterprises engaged in extractive industries in the country and the financial management and accountability of governmental entities. Therefore, Myanmar has been participating in EITI in an effort to ensure its resource wealth is managed for the benefit of the whole population, rather than for a handful of people.

What frequently happens to most developing countries with the greatest natural resource endowments is that private companies carry out activities in extractive industries after receiving a license from government and there is no transparency in such arrangements. As a result, rather than contributing to local development and social peace, those opulent deposits of oil, gas and precious minerals have been translated into poverty, insecurity, underdevelopment and misery for those communities living nearby. Companies pay taxes to government and the government is responsible for managing the revenue of the country in accordance with good global governance standards. As a result, in working towards becoming an EITI country, the government can expect to support local development by adopting better resource governance practices, creating a positive reputation and attracting trust and investment from foreign investors, among many reasons.

In May 2014, Myanmar applied to become an EITI candidate country to the international EITI Board, which approved its application at the 27th Meeting held in July 2014 in Mexico.

MPRL E&P has been participating in MEITI as a member in the Multi-Stakeholder Group, which is a group representing stakeholders from government, companies and civil society organisations. Monthly MSG meetings are held where progresses and challenges are communicated and discussed and the publication of annual reports is one of the major duties of the MSG meetings.

Held every month, there have been improvements in coordination and collaboration among the three groups of stakeholders. Also, tasks are done more efficiently and effectively than before. There are four working group sub-committees to carry out the required tasks prior to MSG meetings. For example, MPRL E&P is a member in the Communications and Outreach Sub-Committee. We attended the Communications Workshop in Inle, in southern Shan State in July 2016 where we drew a Communications Plan and it was one of the highlights of our activities in 2017. Publications of payments made by companies and received by the government form a major element of the initiative, and the very first report of Myanmar EITI was published in December 2016. Now we are progressing towards publication of both the second report for 2014-2015 and the third report for 2015-2016 by the end of March 2018.

It is still too early for us to tell exactly when Myanmar will become fully EITI compliant. A lot of work has to be done to prove that our policies and laws are comprehensive in this regard. The MSG members cannot make laws obviously. If EITI's guidelines are not compatible with national policies and laws, the process can take longer. Another challenge is that the MSG members need to build mutual trust and transparency. Now we are working to become an EITI compliant country but as you can see there are existing challenges that need to be tackled first and based on the nature, the challenges can be either major or minor. Another thing is, as the government is still young and in-experienced, there lacks a momentum in MEITI works and sometimes it depends on the trust of the MSG members, directions and legislative affairs. In some countries, presidents serve as MSG chair-person and members themselves are ministers which improves the whole process, helping it to run faster and smoother. In Myanmar, the chairperson is a deputy minister and most of the members occupy middle management levels. As a result, there is a difference in how efficiently and effectively the work is achieved. This effects in essence how MEITI advances as a whole.

Future progresses and changes are largely concerned with the government of whose term is just five years and we will need to seek the interest and support from a new government thereafter. We need to understand that MEITI plays an essential role in the strategic reforms initiated by the government in terms of making efforts to manage public finances according to the twin concept of transparency and accountability, which is critical for efficient functioning of any democracy. Furthermore, MEITI should be seen as a useful way to help foster trust among government, private companies and CSOs as well as build permanent peace for a socially inclusive, environmentally sustainable country. ■

News

MPRL E&P Joined JobNet VR Career Fair 2018

Moe Thu Zar Soe

JobNet VR Career Fair 2018, the first ever type of job fair in Myanmar which used virtual reality technology was a one-day event held on 10th March, 2018 at the Grand Ballroom of Sedona Hotel in Yangon. With the aim of promoting corporate branding, attracting talent and building networks and relationships with potential candidates, MPRL E&P Group of Companies participated in the career fair to reach a large audience of qualified candidates.

By supporting the career fair through a silver sponsorship, MPRL E&P Group of Companies' business booth at the event offered 40 open positions in technical and business functions such as Engineering, Administration, Finance, Human Resources and Communications. MPRL E&P Group of Companies received well over 1,200 applications at the end of the career fair, which attracted about 10,000 job seekers.

At the JobNet VR Career Fair 2018, there were employment opportunities from 40 top companies in Myanmar which included MPRL E&P Pte Ltd., Myint & Associates Company Ltd., M&AOSB, M&A Telecoms, Ngwe Saung Yacht Club & Resort, Vantage Tower as well as Unilever Myanmar, Heineken, Ooredoo, SPA Group, Gandamar Business Solutions, Frontiir (Myanmar Net), WITTS Myanmar, Metro, Hilton, Diamond Rental Myanmar, Mega

Lifesciences Ltd, RMA Group, AGD Bank, Yoma Bank and CB Bank.

MPRL E&P also participated in a job fair in February 2018 through collaboration with the Centre of Excellence for Business Skills Development and received 95 applications from interested candidates who visited the event. ■

ASEAN-AUSTRALIA
SPECIAL SUMMIT 2018
17 ~ 18 March 2018

State Counsellor Daw Aung San Suu Kyi with Dr. Kobsak, Minister of Prime Minister's Office of Thailand, Mr. Peter Coleman, CEO of Woodside Energy Ltd. and Mr. Tony Fernandes, Founder & Group CEO, Air Asia. Our CEO U Moe Myint participated in the Energy Supply Chain Round Table which was chaired by H.E. Josh Frydenberg, the Australian Minister for Environment & Energy and co-chaired by Mr. Peter Coleman. and Mr. Wan Zulkiflee, CEO of Petronas

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OTCASIA2018

OFFSHORE TECHNOLOGY
CONFERENCE ASIA

KUALA LUMPUR, MALAYSIA 20 - 23 MARCH 2018

BLOCK A-6 GAS DEVELOPMENT PROJECT AND ITS BENEFITS TO THE COUNTRY

U Moe Myint – Chairman & Chief Executive

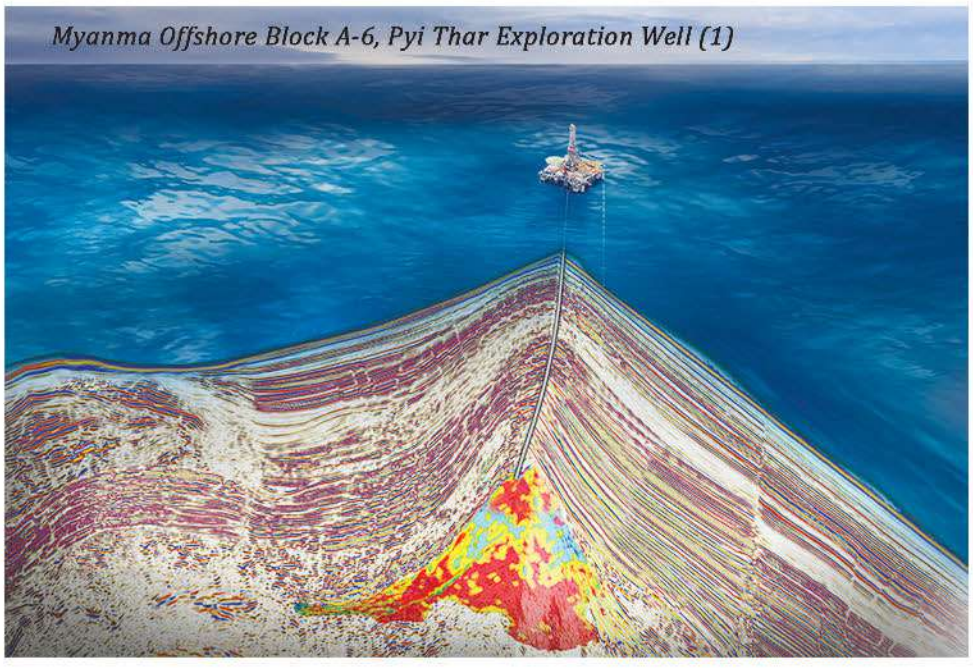
A Summary Background and History

1) GAS IN SUBMARINE CHANNELS OF THE ANCIENT PATHEIN RIVER

a) For some four million years and until one million years ago, **Pathein River** flowed from East to West into the Bay of Bengal rather than North to South into the Gulf of Mottama

b) **Gas** comes for myriads of microbes decomposing organic matter contained in the sediments of the river to use their oxygen and creating pure methane

2) GAS WAS FIRST PROVEN IN SHALLOW WATERS OF BLOCK A-6

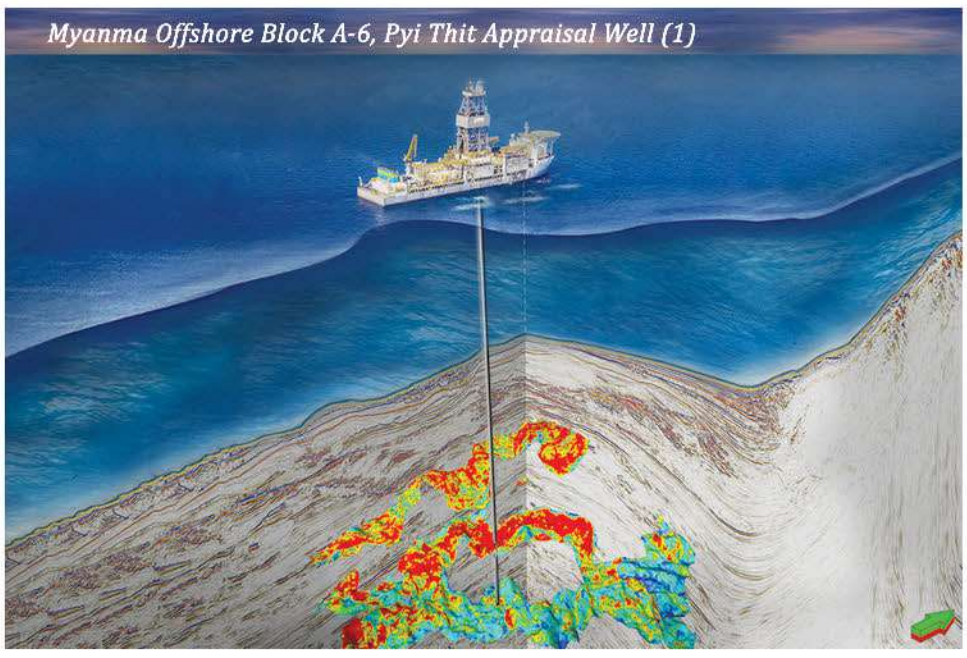


a) MPRL E&P first discovered gas in 2012 in Block A-6 at the company's sole risk investment

b) This result was obtained after five years of studies, opposed to the previous concept of the "Bengal Fan", flowing from North to South, as being the only potential source of gas-bearing sand in the region

c) MPRL E&P matured its own concept of a different East to West flowing Pathein River after acquiring the first exploration 3D seismic survey in the history of the country, which revealed this "new" petroleum play concept in 2010

3) FURTHER EXPLORATION EXTENDED THE NEW PLAY CONCEPT INTO DEEP WATERS OF THE BLOCK



a) Attracted by MPRL E&P's **pioneering concept and gas discovery,** Woodside and Total became partners in 2013 and 2015 respectively, forming the Block A-6 JV

b) Block A-6 JV shot its first deep-water exploration 3D seismic survey in Myanmar in 2013...

c) ..... made **its first ultra-deep water gas discovery** in the country in 2016 *(Shwe Yee Htun-1)*

d) ..... made two more gas discoveries in 2017, and achieved **its first gas test in** *Pyi Thit-1.*

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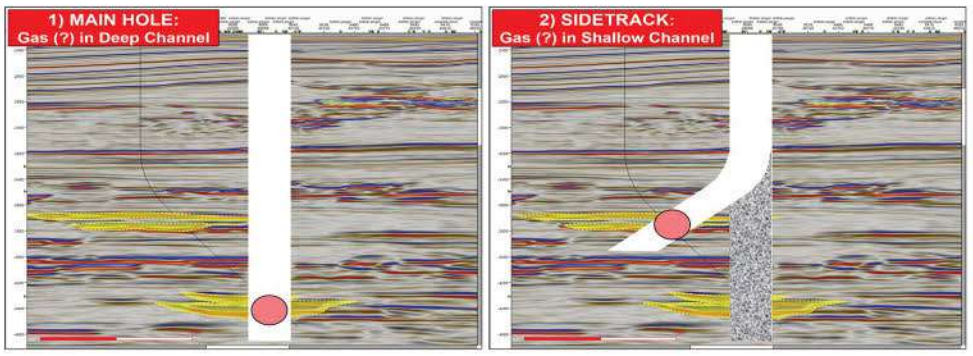
Block A-6: What Will 2018 Likely Bring?

1) WELL SHWE YEE HTUN-2 TO BE DRILLED IN JULY - AUGUST 2018



a) Well *Shwe Yee Htun-2* to be drilled to Target Depth 4,750m (15,584 ft) in Water Depth of 2,325m (7,628 ft)

b) Well to be drilled in two steps: **main hole** will test gas in the deep channel discovered by Well *Shwe Yee Htun-1* (this first ultra-deep water well in-country at that time was not tested)

c) After cementing the main hole, a **sidetrack** will test a shallower channel of the same channel system in Well *Pyi Thit-1*

d) Well *Shwe Yee Htun-2* will bring the A-6 project to **economic threshold** (in the case of full success)

2) SAME DRILL-SHIP AS LAST YEAR'S SUCCESSFUL CAMPAIGN

a) Transocean's drill-ship DDKG-2 : can drill to 10,000 m in 3,500 m water depth

b) Same personnel from the same contractors will face already familiar drilling challenges from previous well experience

c) This will ensure maximum efficiency and excellent data quality

Block A-6: the Technical Challenges to Bring Ultra-Deepwater Gas on Stream

1) SOME RECORDS

a) Block A-6 Gas Development Project will be in **the deepest waters in SE Asia & the Pacific Region**

b) Largest ever single project investment in-country with some US$ 6.2 billion of estimated capital expenditures earmarked

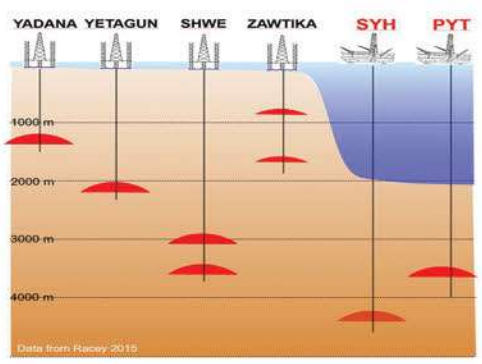
2) COMPLEX TECHNOLOGY

a) Deep waters mean cold and high-pressured environment at sea bottom

b) Gas to be produced by specially designed wells that will need minimal intervention during lifetime

c) Specially designed equipment to facilitate maintenance by remotely operated vehicles in hostile environment

d) Picture shows a well-head of the type to be installed on each gas producing well, the arrow shows an engineer for scale



3) EXPENSIVE INVESTMENT TO BRING GAS TO MARKETS

	SHALLOW WATER GAS FIELDS	ULTRA-DEEPWATER GAS FIELDS
Gas Reservoir Shape	Laterally extensive "pancake" shape A producer well completed in a single reservoir can drain large volumes of gas	Laterally restricted "noodles": A producer well must be completed in several reservoirs to drain large volumes of gas
Reservoir Pressure	Moderate	High
Water Depth	50-200 m (164 - 656 ft)	2,000 - 2,400 m (6,561 - 7,874 ft)
Sea Bottom Pressure	Low	Very high
Sea Bottom Temperature	Moderate	Very cold
Sea Bottom Route to Shore	Generally smooth in soft stable sediments	Generally rough with potentially unstable slope up to shore
Type of Producing Installations	Production platform standing on Sea Bottom	Sub-sea installations connected to processing facilities in shallow water or onshore
Access to Producing Installations	Easily accessible by technicians on the platform	Difficult in hostile environment, only reachable by remotely operated vehicles on special vessels. Completion to be reliable and long-lasting
Development Costs of 3-5 Tcf Typical Gas Field	**US$ 1-3 billion**	**US$ 5-7 billion**

Block A-6 and Local Content

1) GOVERNMENT TAKE

a) MOGE have the right to participate as a 20% equity holder in the project

b) Government take amounts to 72% (MOGE share of production, royalty and taxes)

2) KNOWLEDGE TRANSFER

a) Ultra-deep water gas development projects are not many. Actually, there are less than (20) around the world (Africa, China, Gulf of Mexico)

b) Project Development Team should be based in Myanmar to maximize transfer of technical know-how

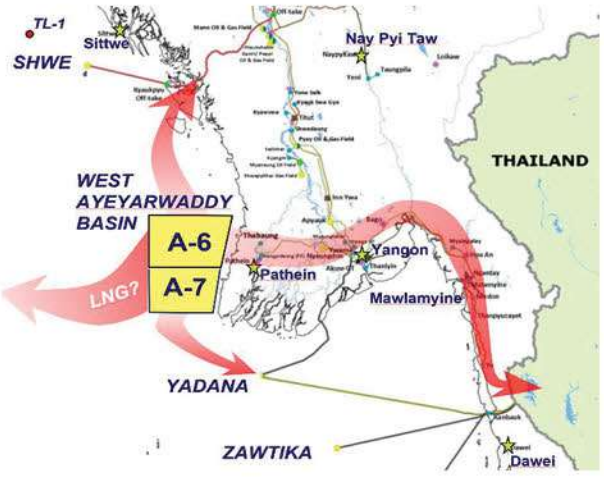
c) As much as practical, experts in HQ to share knowledge with local engineers via short courses or training in-country

3) TRIGGER CASCADE OF INDUSTRIAL DEVELOPMENT HUBS (e.g. PATHEIN)

a) Block A-6 Gas Development Project in the Ayeyarwaddy Division to kick-start industrial development and provide electricity to the largest rice producing region in the nation

b) Connectivity from Pathein to open-up Yangon City to the west coast to alleviate the bottleneck in Yangon River

c) Project is in easy reach of Yangon Region thirsty for more electricity



4) FOREIGN EXCHANGE - LNG POTENTIAL

a) Yadana gas production to decline after 2023: **Block A-6 Gas Development Project** comes at a timely moment to extend Yadana Project life

b) Block A-6 "domestic gas", as the preferred sustainable gas source after 2023, will also **replace short-term Liquefied Natural Gas (LNG) imports** for electricity in Myanmar

c) As more gas is found in Block A-6 and nearby Block A-7, an excess of gas should be available for other industrial projects, such as petrochemicals

d) This excess of gas could also allow Myanmar to become a net LNG **exporter** to nearby thirsty gas markets in South Asia ■

WHO'S WHO at MPRL E&P

Drilling Department

There are two types of engineering in the Drilling department.

(1) Drilling Engineering
(2) Drilling Fluid Engineering

What is Drilling Engineering?

Drilling engineering is a subset of petroleum engineering. Drilling engineers design and implement procedures to drill wells, managing the safe and efficient drilling of wells to procure oil or gas as safely and economically as possible, ensuring that costs are minimized while collecting information to evaluate the formations penetrated, and protecting the environment.

They work closely with the drilling contractor, service contractors, and compliance personnel, as well as with geologists and other technical specialists.

What is Drilling Fluid Engineering?

Drilling Fluid Engineers work on an oil well or gas well drilling rig, and are responsible for ensuring the properties of the drilling fluid (drilling mud) are within designed specifications.

When was the Drilling Department founded?

The Drilling Department was founded from the beginning of MPRL E&P Pte Ltd. in 1996.

What are its responsibilities?

Drilling Engineers

Preparing well data sheets, designing and selecting well-head equipment, preparation of drilling programs including bit selection, drilling string design, fluid hydraulic & drilling fluid program, casing design, estimated AFE, obtaining relevant data, carrying out engineering analysis on site and recommending necessary actions and writing up reports. They work closely with Geoscience team.

Conduct drilling material management (control over equipment and materials and reduce shortages in order to avoid stock outs which can result in costly shutdowns or operation delays). Liaising with specialist contractors, our procurement team and suppliers, such as cement companies or suppliers of drilling fluids, monitoring the daily progress of well operations, keeping track of current daily costs, comparing actual costs with expenditure proposals and recommending cost-effective changes, monitoring safety and ensuring the good maintenance of the well.

Drilling Fluid Engineering

Prior to drilling a well, a mud program will be worked out according to the expected geology, in which products to be used, concentrations of those products, and fluid specifications at different depths are all predetermined. As the hole is drilled and gets deeper, more mud is required, and the mud engineer is responsible for making sure that the new mud to be added is made up to the required specifications. The chemical composition of the mud will be designed so as to stabilize the hole. It is sometimes necessary to completely change the mud to drill through a particular subsurface layer.

Mud engineers are responsible for creating 'mud', or a mixture of fluids, clay and other minerals, that's used in the process of drilling for oil or gas.

Who are its team members?

U Yan Naing Soe (Drilling Operations Manager)

Provides technical and practical advice on drilling operations to G&G/RE as part of the decision making process to identify well candidates. Develops well designs and programs, including specifying all required materials and equipment for all wells drilled in Mann Field (both new wells & deepening), ensuring that the plan will achieve technical objectives, and minimize risks to health, safety and the environment at lowest feasible cost. Consults with Field management and engineering staff to confirm operational viability of the plan and then secures MPRL E&P senior management and MOGE executive approval. Provides leadership to members of the department through mentoring, coaching, performance management and development opportunities so that team members are effective contributors to department objectives and realize their potential for future assignments. Actively encourages team employees' awareness of and compliance with MPRL E&P policies, and HSE policies. Maintain positive relationships with all stakeholders of MPRL E&P's assets.

U Aung Zaw Myint (Senior Drilling Engineer)

Assist the DOM in the preparation of the annual drilling plan and updating through the year based on actual outcomes; Fully understand and actively participate in HSE policies; Identify materials and equipment specified in the plan, work together with team for Field Requisition Forms, and track the material delivery process together with Logistics team.

U Aung Myo Thu / U Zin Lin Tun (Drilling Engineers)

Assist Drilling Manager and Senior Drilling Engineer for related drilling operations; Closely supervise day to day drilling activities which are running in accordance with plan at wellsite; Fully understand and actively participate in HSE policies; Collect data from drilling and mud reports and submit to Senior Drilling Engineer for the End of Well Report.

U Nyi Zaw Oo (Assistant Drilling Engineer)

Assist Drilling Engineer/Supervisor and Senior Drilling Engineer for related drilling operations plans & activities; Learn the theoretical and practical aspects for drilling engineering; Learn to prepare operational programs for drilling new wells and deepening; Assist & implement CSR activities to ensure the satisfaction and increase understanding of the community regarding field operations; Fully understand and actively participate in HSE policies.

U Aung Myo Nyunt/ U Aung Ko Min (Senior Drilling Fluid Engineers)

Senior Mud Engineers design and implement drilling fluid programs to drill wells as safely and economically as possible. They work closely with the drilling team, service contractors, and compliance personnel, as well as with geologists.

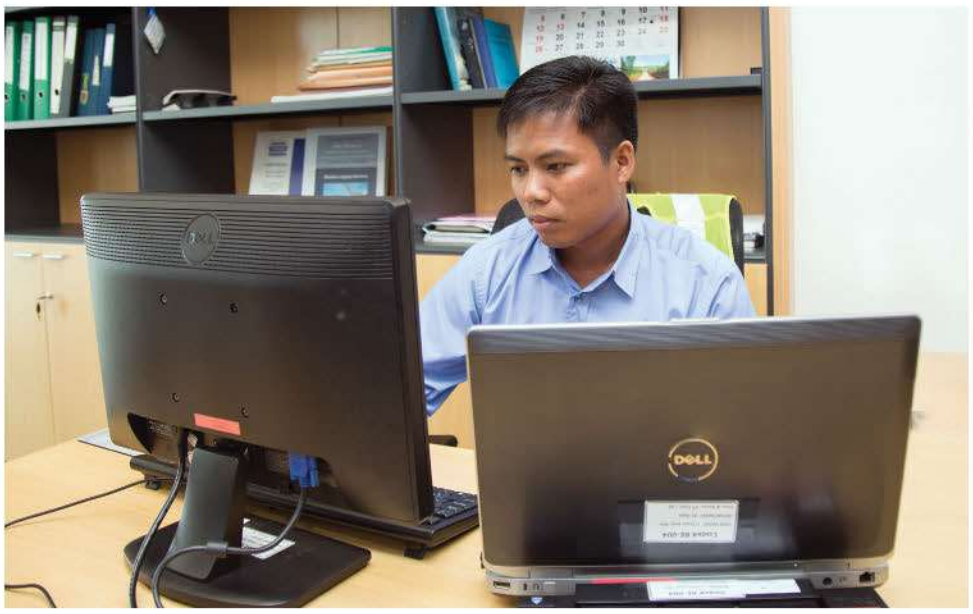
Senior Mud Engineers also review & prepare the drilling fluid completion report with a list of materials used in operations, mud cost, mud chemicals & materials stock. Mentoring engineers & junior engineers about fundamental drilling fluid, formation damage control & operational safety awareness (MSDS of mud chemicals).

U Kyaw Htet Tun (Drilling Fluid Engineer)

Mud engineers are responsible for creating mud, or a mixture of fluids, clay and other minerals, that's used in the process of drilling for oil or gas. Generally, they work with other drilling engineers and geologists. They are also responsible for closely monitoring day-to-day operations, working closely with other departments and third parties at well site, tracking and controlling receipts, issues, usage and well returned materials without operational delays. Drilling fluid engineers also take special care to protect the environment and follow a zero discharge policy of drilling fluid/well fluid, maintain positive relationship with all stakeholders of MPRL E&P's assets, and fully understand and actively participate in HSE policies. ■

THINKING ALOUD with U Kyaw Swar Win

Assistant Reservoir Manager



Role of Reservoir Engineering to Meet Annual Production Targets for Mann Field

Mann Oil Field was discovered in April 1970 by well M-1. Despite the fact that Mann Field has more than 47 years of history and has produced more than 120 million barrels, it suffers from a lack of reservoir management that has a direct impact for not maximizing the recovery and losing some reserves by passing a lot of oil. Mann Oil Field is one of the mature fields in the oil and gas industry and MPRL E&P Pte Ltd. started to operate the Mann Field in 1996. Reservoir Engineers from MPRL E&P seek to extend the economic producing life of the field using cost-effective, low-risk technologies and enhanced oil recovery techniques.

The technology of enhancing oil recovery of our mature field relies on rapid integration and quality control of key geological and well data, including wire-line logs, production/injection by well, completions data, and well trajectories. Automated, machine-assisted workflows enable quick geological mapping, estimation of flow contribution by stratigraphic flow unit, decline-curve analysis, history matching, fractional-flow modeling, drainage-area estimation for all wells by sand formation, identification of pay behind casing, identification of bypassed-oil pockets, production mapping using numerical tracers, and waterflood optimization.

We Reservoir Engineers evaluated the bypass oil of Mann Field reservoir's condition by revisiting the history of the performance of all active wells and shut-in wells by well basic, reviewing the individual sand formation for reservoir fluid contact analysis, reservoir pressure analysis and allocating the fluid flow analysis of by sand and by fault blocks respectively.

We did the study of performance of active wells that reviewed the surface and subsurface contour maps and production profiles/trends of oil, gas, and water and well vintage and grouping analyses of layer by layer and block by block provide a quick, automated framing analysis of reservoir fluid trends and reservoir behavior of dynamic condition. High water cut wells or excessive water production wells are also reviewed and studied by the detailed analysis of formation fluid behavior to cut/shut off produced water and a water invasion of the lower oil producing zone. If we can shut off this water, it will increase oil production of these walls and the reduction of excessive water production is not only for decreasing the produced water, but also for raising field production.

For the study of offline wells or shut-in wells, reviewing the wells currently shut in, which often presents the quickest and easiest opportunities to raise production by doing reopening and pumping and also deepening the additional new formations for this well. The cause of each well's shut-in is characterized on the basis of trends in water cut, gas/oil ratio, and reservoir pressure. These analyses will lead to specific opportunities to restore production from shut in wells and to raise the field production.

We conducted a study of reservoir fluid contact, monitored the fluid contact of producing zones and producing wells which are close to water oil contact to determine if water was uprising or not. We also did the analytics and statistics describing reservoir contact gathered for all wells over time by zone, accounting for well type and lift mechanism. This analysis combines data from completions, formation tops, and production/injection databases to characterize the completion contact on a layer basis automatically. Reservoir engineers worked together with geologists to identify the fluid contact of the static condition of individual formation on the subsurface structural contour maps.

We also studied the trends of reservoir pressure, described by block and by layer, and this is coupled with a voidage-replacement analysis. The results are used to improve or optimize pressure-maintenance strategies and to identify undepleted zones which have some potential oil remaining. We built the production flow allocation by formation so that the flow allocation estimates the production and injection for each formation, in each well, for each month, allowing a granular perspective in performance by formation and by well, which is used in DCA (Decline Curve Analysis) method to forecast the remaining reserves and to forecast to do EOR (Enhance Oil Recovery) methods to enhance Mann Field's oil production. ■

INTERN INTERVIEW with Mr Kyaw Thant and Mr Kit Huat Tay, Students from Curtin University

With Mr. Kyaw Thant

First of all, we would like to thank MPRL E&P and all of its staff for giving us this opportunity to be here in the first place. We would like to especially thank Sayar U Thu Nyo for his guidance and mentorship over this period. Over all, the internship experience at MPRL has been an overwhelmingly positive experience, full of personal and professional developments along the way.

Please introduce your education background and other professional experiences, if any.

My family first migrated to Australia when I was at the age of 11. I then attended a small primary school in my suburb and afterwards, completed my middle schooling at Rossmoyne Senior High-school. Since the early days, I always knew that I would end up pursuing a career in the engineering discipline but who would have guessed that I would be following my father's footsteps and choose to become a Petroleum Engineer. I am now in my final year of my petroleum engineering degree at Curtin University in WA. Alongside my studies, I also work as a mathematics tutor at an organisation called Kumon. My main duties are to observe and instruct students in Kumon Maths worksheets, thus confirming the student's current ability and identifying issues for students to achieve their maximum progress of mastery learning. This includes providing daily feedback to students regarding their progress and supervising/assessing test results. I have also worked as a front desk receptionist where I handled administrative duties for the center. Currently I am also overseeing the studies of 4 students as their private academic tutor, not only ensuring their academic development but also social development as well. In terms of professional exposure related to the petroleum field, I have attended a site visit to the Halliburton Jandakot site and was also present at the APOGCE (Asia Pacific Oil and Gas Conference and Exhibition) as a Curtin University volunteer. I have also attended several SPE networking events and Technical Luncheons trying my best to build connections and get as much exposure to the industry as possible, all in the efforts of preparing myself for the future as a young graduate petroleum engineer.

When did you start applying for Internship and when did you become an Intern? How did you find out about the Internship Program and get chosen as an Intern?

At Curtin University all engineering students must accumulate 480 hours of work experience as part of the graduation requirement. The university allowed me to count a maximum of 120 hours from my part time employment as an academic tutor. In order to fill the remaining hours, I was required to search for vacation employment opportunities with an engineering company. I was given the opportunity to complete my internship at Add Energy in Perth. While I was grateful for the opportunity offered by Add Energy, I personally wanted one that include practical well site experience. Therefore, I ended up asking my father if MPRL E&P is

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The Environmental Impact Assessment ("EIA") Process in MPRL E&P

HSE Team

What is the purpose of an Environmental Impact Assessment or EIA?

According to words of Wikipedia, an EIA is a public assessment to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. Environment has to be understood in its broadest sense, natural as well as social. An EIA is the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. EIA's require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts. An EIA is therefore as good as the proponent of the project is transparent and open by inducing the concerned public to participate. In the case of this paper, MOGE as the operator of the Mann Field and MPRL E&P as its contractor are the proponents of the EIA on the Mann Field's operations.

Myanmar's EIA Process

Promoting and practicing transparency lead to improved governance and open the door to social license. Our values encourage us to conduct our business with honesty, integrity and fairness in all aspects, whether operational environmental and commercial. It is worth noting here that the Mann Field is the first onshore oil field in Myanmar to undergo such stringent environmental procedures to comply to the law, a performance carried out at the initiative of MPRL E&P.

With investors and employees increasingly interested in and concerned by the social and environmental performance of their companies, transparency is a corporate necessity. Transparency in a company also vastly enhances company culture, employee morale and productivity; therefore it very much makes business sense. An open and transparent culture sends a strong message to the workforce and to its clients, telling them that they are trusted and valued members in the organization, united to work together towards a common goal.

MPRL E&P shall disclose all environmental related policies, reporting of EIA and/or SIA assessments and results which are recognized by a consensus of relevant stakeholders including, but not limited to, host communities, government representatives, local non-government organizations (NGOs), civil society organizations (CSOs), and international non-governmental organizations (INGOs) .

In compliance with the Myanmar Environmental Conservation Law and Environmental Impact Assessment Guidelines, MPRL E&P has undertaken an environmental and/or social impact assessment (EIA or ESIA) in three of its onshore assets. These ESIA's focused primarily on public consultation and collecting baseline data to identify and measure risks impacting the business and project-affected communities. Concerns and complaints have been recorded and disclosed on the company website.

MPRL E&P commissioned Environmental Resources Management (ERM), a contractor specializing in environmental and social studies for a number of projects in accordance with the requirements of the Myanmar Environmental Impact Assessment Guidelines, to undertake environmental, social and health impact assessment studies for Mann Field together with MOGE. ERM conducted its surveys independently, however MPRL E&P's CSR and HSE team supported data collection of baseline survey. In May 2015, MPRL E&P conducted the environmental base lines survey by certified ERM person as follows;

Biological Environment Survey

- Habitat mapping and vegetation surveys;
- Terrestrial fauna surveys, including avifauna (birds), mammals, herpetofauna (amphibians and reptiles) and butterflies; and
- Aquatic fauna.

Physical Environment Survey

- Ambient air quality
- Ambient noise
- Groundwater
- Surface water
- Soil quality

Ambient Air Quality and Noise Monitoring

Surface Water Sampling

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Groundwater Sampling

Why is baseline data collected?

Baseline data is collected to serve two purposes in the EIA study. First, it helps us understand the current conditions of the area, and how the project needs to be implemented considering these conditions. Second, and most importantly, it helps us assess and predict the possible environmental changes that could occur, once the project is underway.

Baseline data is the data collected about various factors of the project study. This includes :

- Physical - the area, the soil properties, the geological characteristics, the topography, watershed properties, etc.
- Chemical - water, air, noise and soil pollution levels, etc.
- Biological - the biodiversity of the area, types of flora and fauna, species richness, species distribution, types of ecosystems, presence or absence of endangered species and/or sensitive ecosystems etc.
- Socioeconomic - demography, social structure, economic conditions, developmental capabilities, displacement of locals, etc.
- Cultural - location and state of archaeological and/or religious sites.

Socio-economic and public health surveys

Collected

14

Villages

In revising ESIA Report with HIA and Health Management Plan in accordance with the Myanmar EIA Procedure (2015), Stakeholder Consultation, Baseline Socio-economic and Public Health Surveys are being conducted by Environmental Resources Management (ERM), on behalf of Myanma Oil and Gas Enterprise (MOGE) and MPRL E&P Pte Ltd., in Mann Field from 8th to 13th January 2018.

EIA Review Process

1. Initial review by ECD
2. Submission of report on initial review to RT (RT members from relevant ministries and academic institutions)
3. Meeting with RT, Proponent, EIA consultancy firms
4. Site visit (if required)
5. Provide comments on EIA report to the Proponent
6. Revise EIA reports based on the comments and submit them to ECD
7. Meeting with RT, Proponents, EIA Consultancy firms
8. If satisfied, Submit to National Environmental Conservation Committee and issue ECC & if unsatisfied repeats step 5,6,7

Environmental Resources Management (ERM) is now preparing final revised ESIA & HIA report, which will be submitted by MOGE to the Environment Conservation Department (or ECD, part of the Ministry of National Resources and Environment Conservation - MONREC). The ECD will closely study this report, will probably ask clarifications and likely inspect the Mann Field before arranging for an approval to operate the field under the form of an Environmental Compliance Certificate (ECC).

Meanwhile, MPRL E&P has already been implementing its own Environmental Management Plans (EMPs) and Environmental Action Plans (EAPs) for several years, which have been developed to monitor and minimize the environmental impacts of our projects. These plans may need some alignments with ERM's recommendations but provide all mitigation measures to minimize the environmental impact associated with our activities. These plans include:

- Zero discharge targets
- Fuel and energy consumption reduction
- Well-site abandonment
- Environmental Analysis and Monitoring Framework
- Environmental Incident Response Plan
- Waste Management Plan

In Mann Field, MPRL E&P is conducting monthly coordination review meetings on top of the daily meetings with MOGE to maintain and reinforce proper coordination channels on environmental issues and concerns, as well as to identify any gaps and challenges among MOGE, MPRL E&P and all communities living in the field. Community Investment Review Workshops with MOGE, Township Authorities and Communities are conducted quarterly. The Mann Field CSR progress report submitted monthly to MOGE provides an overview of MPRL E&P's CSR approach including a progress update of activities planned for the fiscal year. The intent of the information is to strengthen alignment and communication between MPRL E&P and MOGE to prevent overlap and maximize impact at the field level.

By being the first onshore operator or contractor to bring the Mann old oil field under the latest rules and regulations of the environmental law of the country, MPRL E&P continues to spearhead Myanmar onshore industry efforts in promoting and implementing environmental practices of stringent international standards. ■

What are the Technical Challenges to bring Ultra-Deepwater Gas to our Shores?

Dr. Eloi Dolivo

Offshore gas production from Myanmar now comes from fairly shallow reservoirs in shallow water (less than 200 m water depth); most of these reservoirs are **pancake**-shaped, meaning that one well can drain a large amount of gas.

By contrast, the next generation of Myanmar offshore gas production will come from ultra-deepwater and deep **noodle-shaped** reservoirs, initially from Block A-6 continuing to be a pioneering hub of petroleum activities. What are the challenges to develop these reservoirs?

Fig. 1: Water and reservoir depths of offshore Myanmar gas fields; SYH and PYT respectively stand for the Shwe Yee Htun and Pyi Thit gas discoveries

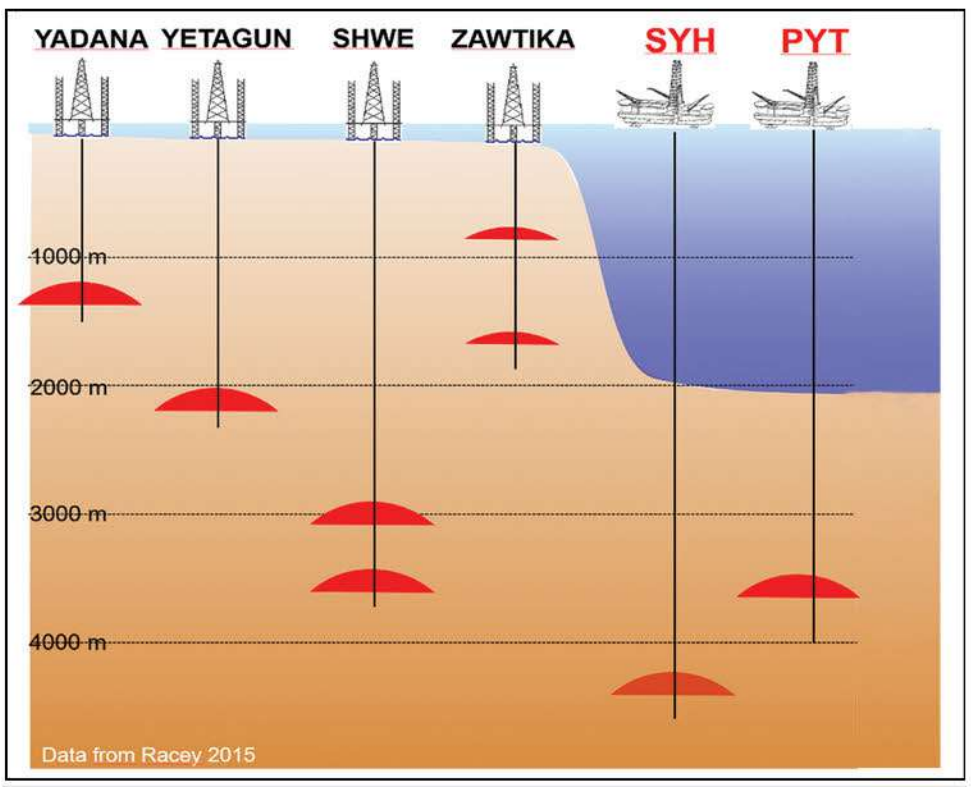

Fig. 1: Water and reservoir depths of offshore Myanmar gas fields

There are not so many ultra-deep gas developments around the world, the main gas production areas are best highlighted by the export of their gas under the form of liquid natural gas (LNG) to energy-hungry regions (fig. 2). Among these major gas-producing areas, just half a dozen around the world are deep-water gas development hubs, most of which are actually straddling the 200-m water depth mark. Even among these few hubs, only some of their gas comes from fields under deep waters. Only three more significant deep-water gas hubs are known to be coming on stream within the next five years or so, two around Africa, and one in the deep waters of eastern India. One of these areas, namely Mozambique and Tanzania, is actually a significant competitor to Myanmar deep-water gas.

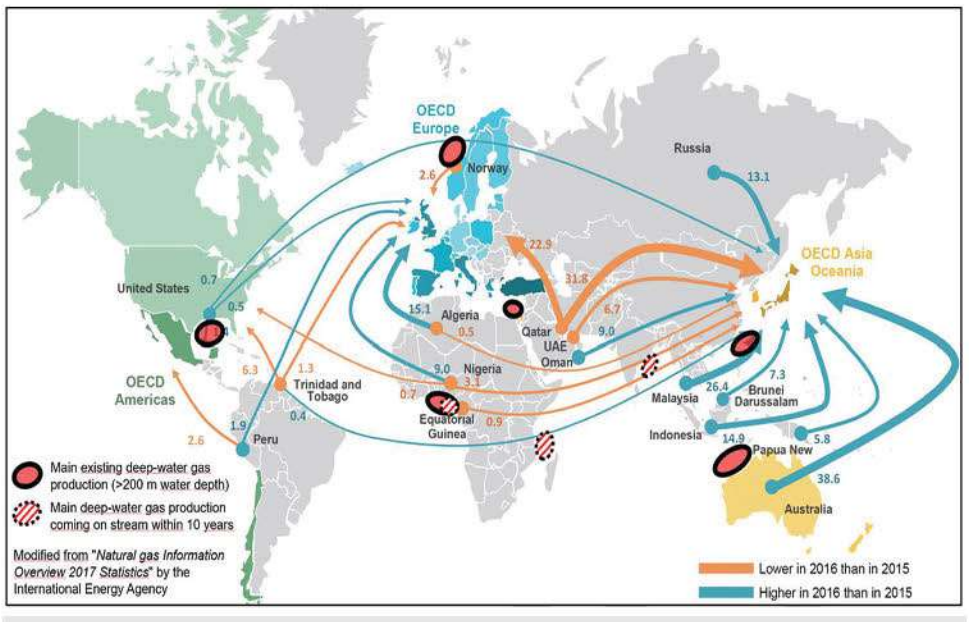

Fig. 2: Main LNG trade roads around the world highlighting deepwater gas production hubs

Fig. 2: Main LNG trade roads around the world highlighting deepwater gas production hubs; figures are in billion cubic metres per year; main deep-water (>200 m water depth) gas production hubs, namely Australian NW Shelf (most production in less than 400 m of water), India (KG basin under development), China (Liwan deep-water at about 1,000-1,200 m of water), Niger Delta in Nigeria (1,000-2,000 m water depth) and Equatorial Guinea (200-2,000 m water depth, Gulf of Mexico (1,000-2,500 m water depth) and offshore Norway. Only three more projects are known at this stage to come on stream, namely East Africa (Mozambique and Tanzania), Equatorial Guinea and Nile Delta in the eastern Mediterranean Sea. Note that the oldest ultra-deepwater petroleum production province is in Brazil, pioneered by state company Petrobras in the 1980's, and is producing oil rather than gas.

It is in ultra-deep waters

Ultra-deep waters mean **cold temperature** and **high pressure.**

Temperature (fig. 3): all around the globe the temperature below 1,000-1,500 m of water is below 5°C regardless of your location on Earth. Only surface temperature significantly changes, depending on how the sun warms up the location, and strongly affecting regional climate.

Fig. 3: Sea temperature vs depth; the "thermocline" is this water zone where temperature is rapidly decreasing, typically between 500 and 1,000 m

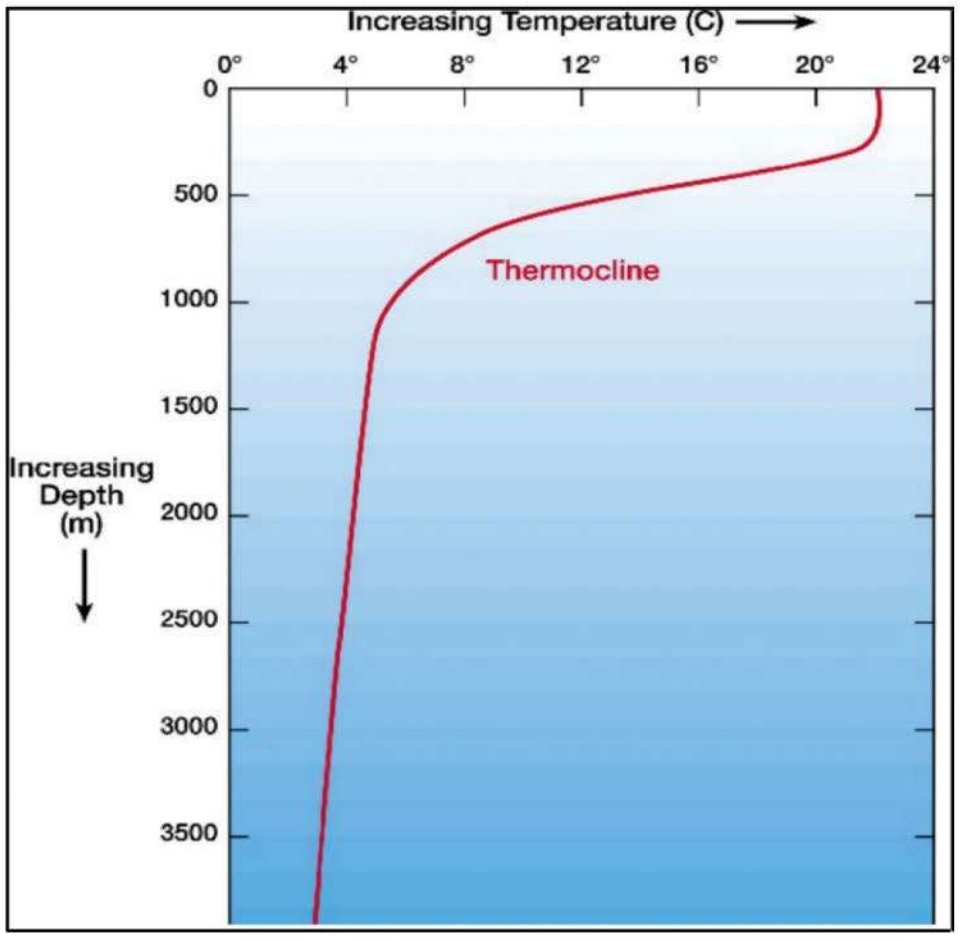

Fig. 3: Sea temperature vs depth

Pressure: You are bearing on every cm^2 (about the surface of the nail of your little finger) of your head and shoulders a weight of 1 kilogram of air (at sea level); this pressure amounts to "one atmosphere". Engineers also use other pressure units such as "kilogram per square centimetre" (kg/cm^2) "pound per square inch" or psi. You do not feel it because this pressure is all around you and you are built to withstand it, your internal pressure is also about one atmosphere. Under some 2,000 m of water depth, on every cm^2, there is a crushing 200-atmosphere pressure; such is the pressure that you would simply dissolve in less than a month.

Yet even in this most hostile environment, with small amount of oxygen, very little food, no sunlight and constant extreme cold, amazingly enough, there is life (fig. 4).

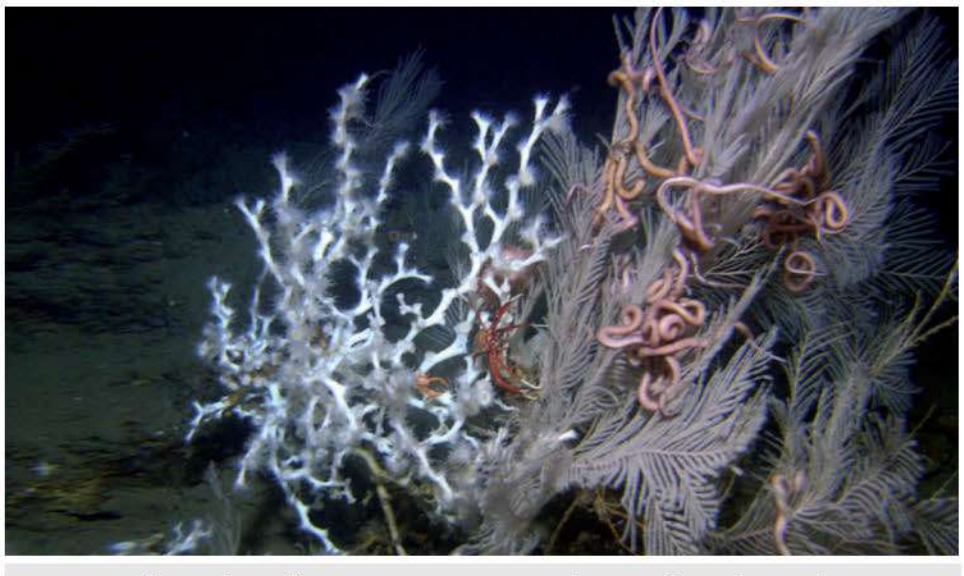

Fig. 4: Life in ultra-deep waters; not exactly our idea of paradise

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Fig. 4: Life in ultra-deep waters ; not exactly our idea of paradise
Some implications of ultra-cold ultra-pressures in ultra-deepwaters from a gas perspective: It is just impossible for human beings to work effectively at these water depths. More specifically, from an engineering perspective, if there is only even a tiny amount of water produced with the gas, these will combine to form gas hydrates, which will plug sub-sea installations and pipes. This problem is unknown in our shallow water gas fields, where the sea bottom is still in the 10-20°C temperature range. To combat the formation of **gas hydrates**, the engineers arrange for injecting chemicals (essentially – undrinkable - alcohols, such as ethylene glycol) in mobile parts of deep-sea installations to prevent freezing by gas hydrates.

Development is complex

Petroleum can be reached nowadays under more than 3,000 m of water depth (fig. 5) by several production systems; the choice of such a system is very much driven by economics. Proximity to markets and ease to maintain installations generally lead the choice of concept. Deep sea gas being a relatively cheap commodity, easy to process compared to oil, will generally be developed by **sub-sea installations.**

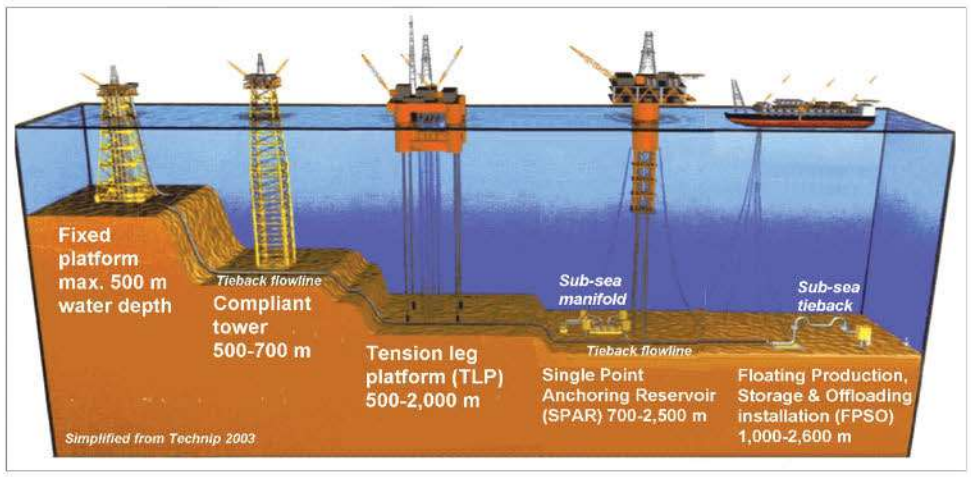


Fig. 5: Petroleum production systems and water depth

Fig. 5: Petroleum production systems and water depth ; note that the deepest system emerging from water while directly resting on the sea bottom is at about 700 m water depth; installations producing from deeper waters are floating anchored systems (TLP, SPAR or FPSO), or installations resting on the sea bottom and linked to a shallower platform by sub-sea tieback flowlines

Gas is produced through **subsea trees** connected to a **manifold** laid on the sea bottom connected to **shallow water processing facilities** on a platform and finally transported to the onshore markets by pipelines (fig. 6 and 7). These sub-sea installations are controlled by a **subsea production control system** managed from the shores via a complex system of flexible **umbilical lines** carrying various fluids to lubricate the sub-sea trees and prevent them from freezing, as well as electrical and hydraulic connections to power these trees. Because men cannot directly intervene at these hostile water depths, every piece of installation must be installed and maintained by **remotely operated vehicles** (ROV, fig. 8) from dedicated vessels. In order to minimize costly maintenance, the wells and the sub-sea installations must be built to exceptional standards to withstand seawater corrosion, cold temperatures and high pressures. Once a deep-water gas field is put on stream, it ideally needs only minimal intervention for some ten years or so.

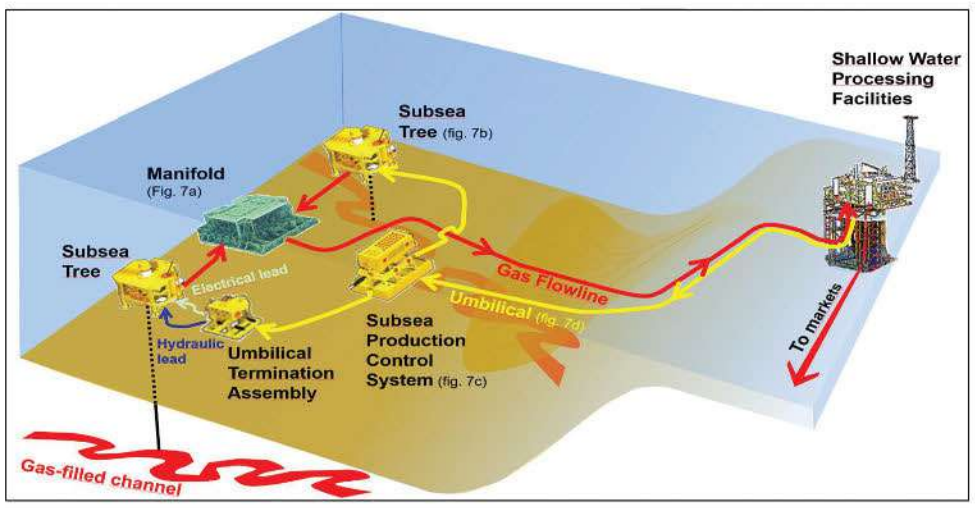


Fig. 6: Typical gas producing sub-sea installation and connection to shore

Fig. 6: Typical gas producing sub-sea installation and connection to shore; this picture is **VERY** simplified as it shows only two wells, while a typical 3-5 Tcf gas field may include 20-30 wells, several manifolds and associated subsea production control systems

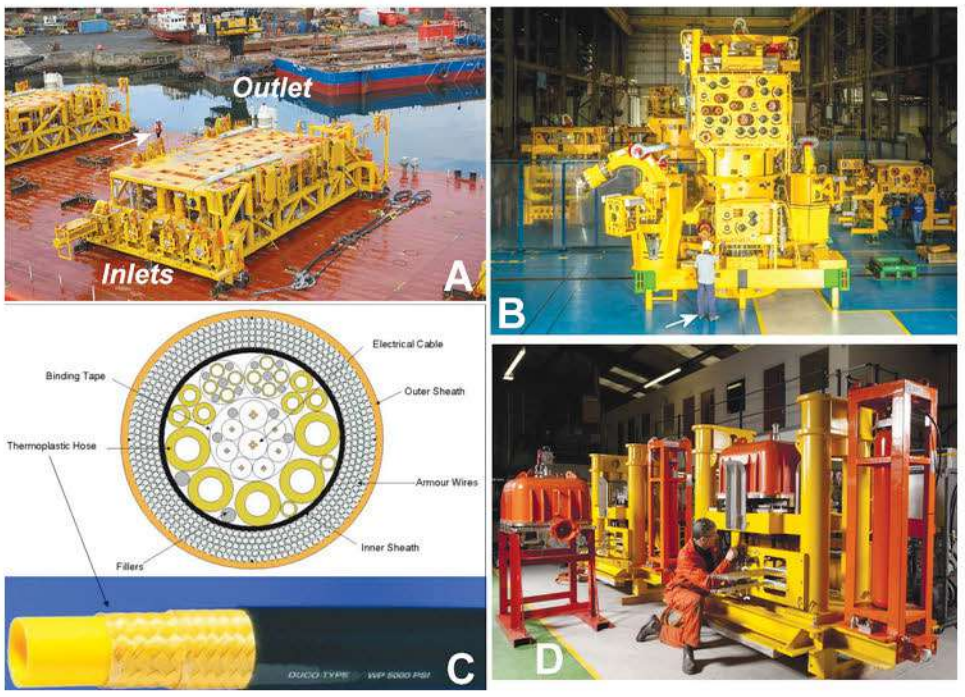


Fig. 7: Some key elements of subsea installation

Fig. 7: Some key elements of subsea installation

A: a **manifold** ready for transport; note the size given by the white arrow showing a man
B: a **subsea tree**; note again the size of the standing man (white arrow)
C: a section of **umbilical**
D: a **subsea distribution unit**

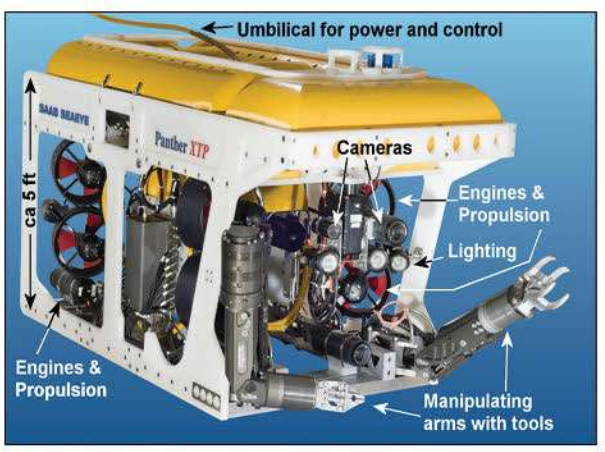
The **manifold** is an arrangement of piping and valves designed to combine, distribute, control and often monitor fluid flow. Manifolds are used to simplify the subsea system, minimise the use of pipelines and optimize the flow of fluid in the system. The manifold shown on fig. 7A shows at least three inlets for the production coming from as many subsea trees. Manifolds can be distinguished between production manifolds, gas injection manifolds and water injection manifolds depending on the fluids they handle.

The primary function of a **subsea tree** (fig. 7B) is to control the flow out or into the well. A tree often provides numerous additional functions including chemical injection points, well intervention means, pressure relief means, monitoring points (such as pressure, temperature, corrosion, erosion, sand detection, flow rate, flow composition, valve and choke position feedback), and connection points for devices such as down hole pressure and temperature transducers. On producing wells, chemicals such as alcohols or oil distillates may be injected to prevent production problems (such as blockages). The subsea tree includes a control system to monitor, measure, and react to sensor outputs on the tree or even down the well bore via a downhole safety valve.

Umbilicals connect all elements of the subsea installation with the surface to allow for communication and remote operations. The particular umbilical of fig. 7C is a main line of communication, with smaller "flying leads" only including a few electrical, hydraulic and/or chemical lines connected to subsea trees from main umbilicals.

The **subsea distribution** unit (fig. 7D) distributes the power for the operation of the various subsea trees and manifolds. This unit includes the hydraulics and electrical power to provide an electro-hydraulic control system. The hydraulics is used for the operation of the control valves and the electrical power provides power to the control system on each of the trees. Redundant communications are also included to alleviate breakdowns.

Fig. 8 The workhorse of the deep sea: a Remotely Operated Vehicle (ROV)



The initial processing of the gas, including the separation of water and condensate, occurs at the **Shallow Water Processing Facilities**, a shallow-water platform, where the compression installations are installed to boost gas production in the export pipeline to markets. The shallow-water platform is usually unmanned, and remotely controlled, together with the subsea production facilities from an adequate control room onshore.

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Community Investment: the Key to Strategic CSR

G Yaw Bawn

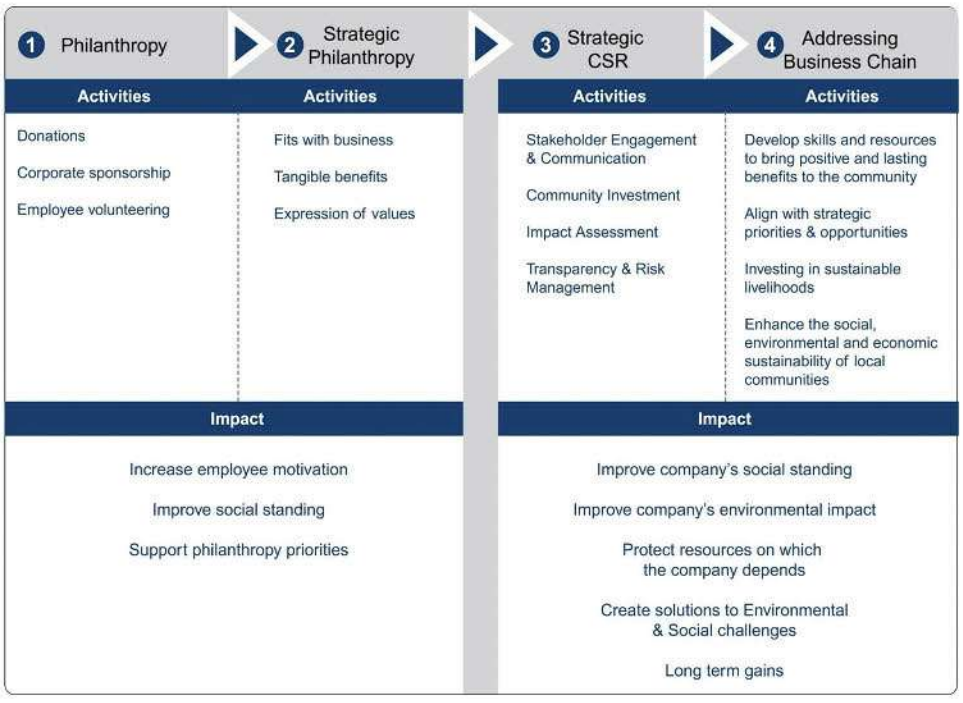
Investing in Communities

Companies have to be aware of outdated, narrow-minded approaches to value creation where they focus only on short-term financial performances and overlook the unmet needs of communities affected by their activities, missing the opportunity to develop a long-term beneficial relationship. The competitiveness of a company and the well-being of its surrounding communities are linked together. Generating economic value for the business in a way that also produces value for society by addressing its challenges can be a shared value approach which brings success to the business and progress to society.

In Mann Field, we do this by embarking on sustainable and inclusive CSR initiatives which addresses the needs of local communities while helping us to effectively solve the effects of our operations on the environment and people in the area. Unlike some companies who employ external development project experts to manage community development programs, our in-house experts-cum-staff go to the project area, collect socio-economic baseline surveys covering population, livelihoods and community needs, and develop community profiles which will help them identify ways to better contribute to local development. Our team reaches out to engage with local communities and arms them with skills needed to lead the community initiatives that we are implementing in Mann Field.

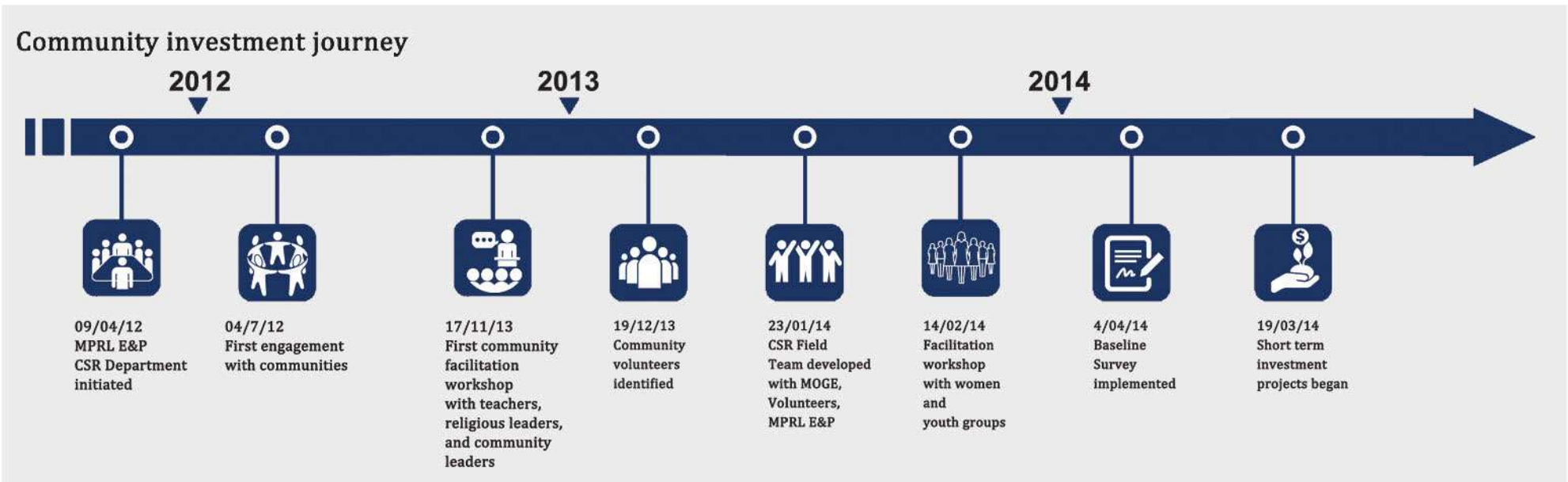
MPRL E&P started implementing philanthropic Corporate Social Responsibility initiatives in Mann field since its assumption of responsibility in 1999, concentrating on four areas: strengthening access to education, improving access to basic healthcare, water and sanitation, socio-cultural initiatives, and disaster response and management. It was in 2012 that the Company began to further develop its CSR thinking from a philanthropic one to a more strategic focus, which centers on engaging and supporting the development of local communities.

How we evolve and implement CSR activities



MPRL E&P recognizes that strategic community investment projects should provide value for the company and have a positive impact on the community. MPRL E&P's criteria include:

- Projects must be strategic in that they address risk and impact resulting from operational activities
- Projects must have a rational reason for investment
- The project outcome and impact should be measured to indicate significant change



Fiscal Year 2015-2016 (Mann Field) : 10 short term projects implemented

- 9 short term water tapping projects implemented
- 1 school infrastructure support project implemented
- Socioeconomic baseline established
- 14 volunteers from target communities identified and trained
- 1,241 HHs and 846 students gained access to WASH through community-led participatory projects

Fiscal Year 2016-2017 (Mann Field) : 5 short term projects implemented

- 4 drinking water purification units installed in schools
- 1 vocational training conducted (low cost household cement water container making training)
- Conducted TOT training for field staff and volunteers (Community Based Organization strengthening training)

Fiscal Year 2017-2018 (Mann Field) : 16 short term projects implemented

- 7 school drinking water purification units installed
- 1 Infrastructure project implemented in flood affected village
- 4 School fencing projects implemented in 4 villages
- 4 vocational skills trainings implemented (food stuff making, soap making, pea-based value-added products making and sewing trainings)

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Key Performance Indicators of Overall CI projects

Key performance indicators identified for each project will be monitored and tracked based on the project type:

- Number of projects identified and implemented
- Percentage of beneficiary satisfaction on quantity and quality of the project
- Number of trainees who practice and establish small scale businesses

Good Practice

Our approach on CI projects is bottom up, community led and based on partnerships. Before we implement CI projects in the villages, we formed village development committees to represent the whole village, then we discussed with VDC members for community needs and priorities with the participatory tools and methods to design and implement simple small scale "micro" projects that are aligned with the actual communities. In order for longer term use and increasing their sense of ownership, we let the communities be involved on decision making and financial responsibility.

The project costs are estimated by the VDCs and we discussed how much the communities will contribute. Every CI project must contribute cash from the communities partially. During the implementation period, the CI field team are monitoring and guiding to achieve quality results. After the completion of the project, the CI team conducted project end reflection workshops with respective VDCs on what they have learned from the project activities and what we need to improve for further projects.

We also believe that capacity building is the most important component for the sustainable development of the community. VDC are important roles to implement CI projects in villages and for this reason, we build up management and leadership capacity for the smooth implementation of the project. At the same time, we also support the skills of organizational development capacity so that VDCs are functioning for longer term village development.

Reporting and Communications

It is important to inform key stakeholders of what we are doing and what we have achieved to date. For the township level stakeholders, we conducted quarterly performance meetings with key government departments, members of parliament and VDC members, and at the meeting we discussed and received advice on the activities completed from the last three months and the challenges, difficulties and needs for improvement. We also reported through various communications tools such as our Facebook page, company website, quarterly newsletter, and regular meetings with communities and government stakeholders in the field. ■

> **"Creating value and impact through strategic community investment requires focus, clear understanding of community needs, healthy partnerships, effective implementation, and tracking and evaluation."**

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It's pricy! It's risky!

Even though we have proven gas can flow at commercial rates such as in Pyi Thit-1, risks are still present: the gas is ultra-deep, ultra-pressured, lying under ultra-cold waters. The reservoirs are noodle-shaped sand bodies that need almost surgical well emplacement to optimally produce without re-entering the wells for long periods of time. The slopes from deep to shallow waters which will support the pipelines and umbilicals may be unstable or rocky. These risks are summarized in table 1 below

	SHALLOW WATER GAS FIELDS	ULTRA-DEEPWATER GAS FIELDS
Gas reservoir shape	Laterally extensive "pancake": Enough for draining large volume of gas	Laterally restricted "noodles": Needing vertical stacking of several storeys of channels to drain large volumes of gas
Reservoir pressure	Moderate	High
Water depth	50-200 m	2,000 - 2,400 m
Sea bottom pressure	Low (ca 75-300 psi)	Very high (ca 3,000-3,500 psi)
Sea bottom temperature	Moderate (10-20°C)	Very cold (4-5°C)
Sea bottom route to shore	Generally even in soft stable sediments	Generally rough with potentially unstable slope up to shore
Type of producing installations	Platform sitting on sea bottom	Sub-sea installations connected to processing platform in shallow water
Access to sub-sea producing installations	Completion is standard of the industry and easily accessible	Completion must be reliable and long-lasting as access is challenging
Development costs of 3-5 Tcf typical gas field	US$ 1-3 billion	US$ 5-7 billion

Table 1: Summary of challenges of developing shallow vs ultra-deep water gas fields

How is the industry organized to design, procure, construct, implement, maintain and coordinate the provision of gas from deep waters to your gas burner?

While figure 9 shows you a very simple linear sequence of events in the development phase of a petroleum project, reality is quite messier. Just as most petroleum companies nowadays do not drill wells anymore, but sub-contract this activity, petroleum companies now entrust most of field development to engineering and construction firms from the details of designing the concept to the commissioning through the construction phase. Many people with diverse talents and backgrounds are involved in the engineering and business areas, such as, but not limited to: geoscience, drilling, reservoir, subsea, facilities, mechanics, hydraulics, electronics, flow assurance, pipelines and flowlines, production, installation, marine operations, process, project management, legal and commercial.

In such complex projects, which are not yet mainstream activities in Myanmar, it is essential that the country takes the lead early on in ensuring local content is optimized to procure to Myanmar citizens' learning and business opportunities.

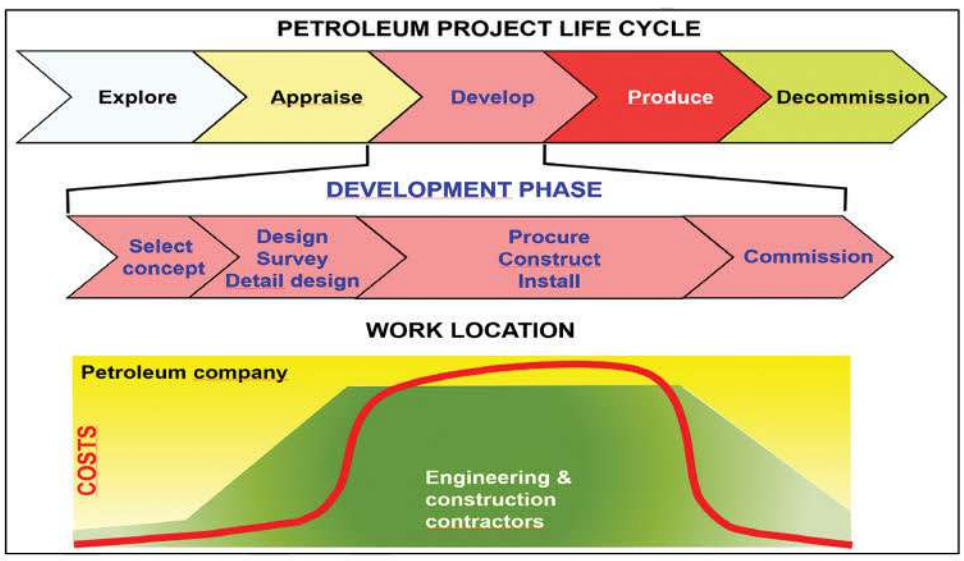

Fig. 9: The development of gas in the petroleum project life cycle

While shallow waters projects such as the one producing gas in Myanmar have cost some US$ one-three billion range to produce 3-5 Tcf of gas, an initial price tag to develop about the same amount of gas points at some US$ five to seven billion, i.e. some three times as much. This mighty amount is because of all the technical challenges existing in hostile deep waters and which are absent from shallow waters.

It is hoped that you enjoyed this little paper in simple language, but please remember, just because it is written in simple language does not mean producing an ultra-deepwater gas field is simple!

Enjoyed the reading? Want to know more? Just link to your excellent favourite MPRL E&P's digital Science Books library – an ***amazing library full of science and technology books*** *(more than 2,800)* ***for you, family, friends, fellow students and teachers, completely free of charge****, regularly beefed up and maintained – such as the Non-Technical Guide to Deepwater Petroleum E&P book under\\myosrvf03\GROUP2\08.00 Multidiscipline Share\SCIENCE BOOKS\NON TECH GUIDES FOR PETR INDUSTRY\Deepwater Petroleum Exploration & Production.pdf and look at pages 213 to 249.* ■

The Importance of Communicating CSR

Thae Aei Khinn Zaw

When it comes to the topic of "The Importance of Communicating CSR", we first need to understand thoroughly what CSR is and what its functions and key factors are. Corporate Social Responsibility (CSR) is a practice that contributes to long term development by delivering economic, social and environmental benefits for all stakeholders, who might directly or indirectly be involved in the activities of the business operations. The establishment of a CSR strategy (sometimes referred to as a sustainability strategy) is a vital component of a company's efficiencies and something that should be led by the organization itself. This means having policies and procedures in place which integrate social, environmental, ethical, human rights or consumer concerns into business operations and core strategy – all in close collaboration with stakeholders involved.

CSR policies need to be considered as a core and inseparable component of the overall service or operations. As CSR programs continue to evolve and extend their reach, it may well become the case that companies find themselves under added pressure to have their CSR initiatives deliver a strong financial result. If this is indeed true, many would question whether this financially-orientated approach is not somewhat at odds with what the core aims of a CSR program are supposed to be because sustainability is clearly important. More businesses are adopting a strategic approach to their CSR policies because they are increasingly aware of the benefits across their business and for their stakeholders. CSR allows businesses to demonstrate their values, engage their employees and communicate with the public about how they operate and the choices they make, to ensure a sustainable future. CSR also helps pave the way for partnerships between businesses and civil society that are based on common goals and shared actions to deliver impact-driven outcomes.

In doing business operations, MPRL E &P always practices the "Do No Harm" approach and supports sustainable energy for long term. Through our organizational capabilities, experience, and strategy, we will continue to deliver results that have a long lasting positive impact towards the growth and development of the country. The CSR objectives of MPRL E&P is to contribute to sustainable development and improvement of livelihoods of communities, which we believe is investing in the communities. That investment focuses on engagement with local communities where we operate and to support education, capacity development and vocational training. In addition, we also try to improve the areas of water, sanitation and hygiene assessments for the community. We engage with communities in open and constructive ways in order to communicate the activities of our CSR well, so that way we can find out the outcomes of our CSR activities and become better day by day.

While some companies hire an external workforce to manage community development programs, our in-house CSR & Communications Team go to the project area, collect socio-economic baseline surveys covering population, livelihoods and community needs, and develop community profiles which will help them identify ways to better contribute to local development and our team reaches out to engage with local communities and arm them with skills needed to lead the community initiatives we are implementing in Mann Field. By building their capacity to manage such development projects and involving them in the process, we believe we ensure sustainable and inclusive growth in the local area.

As CSR is associated with sustainable development such as in Economic Growth, Community Involvement, and Environmental Action, delivering the message about what CSR activities have been done to the communities as well as to the environment in effective ways lead to let us get social licenses as different stakeholders have different perceptions towards the operations of our business.

All in all, communicating CSR effectively is regarded as one of the main strategies to define the core value of the business as there is no point in carrying out CSR activities without proper communication to all respective stakeholders involved. MPRL E&P carries out CSR initiatives in an all-inclusive manner involving all stakeholders concerned rather than merely just philanthropic work. In addition, MPRL E&P implements infrastructural projects to meet the needs of the local communities and developed a system which addresses grievances incurred by local people as a result of its operations. Along with need assessments and public consultations with village officials, Town Elders, Development Committees, and communities, regular engagement and reviews are carried out from the beginning until the end of the projects to ensure sustainable results. ■

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offering any internship opportunities since he used to work for MPRL E&P in its early days. He contacted his past co-workers and colleagues that are still working at MPRL E&P and informed me that the company does take in interns from time to time. I then emailed my resume and cover letter to Sayar U Thu Nyo to apply for the intern position and was accepted.

As an Intern, how long will you be studying at MPRL E&P and please tell us your future plans after you have finished your studies?

My planned internship duration at MPRL E&P is around 70 days with alternating designations between Mann Field and the Yangon Office. My primary focus after my internship would be to complete my final year of petroleum engineering degree at Curtin University. My future ambitions are to secure employment within an oil and gas company and further develop my interpersonal and engineering skills to make significant contributions to the organisation I am employed with. As a soon to be graduate engineer, I am keeping my options open as to which discipline of petroleum engineering to work in. I plan to take as many opportunities presented, to work in different disciplines so that it will allow me to distinguish a discipline I'm truly passionate towards later in my career. But more specifically, I would like to gain some early offshore experience because I've heard that the experience is exciting and challenging at the same time, packed with intensive training courses. I believe that would offer me a great challenge and the most opportunities for growth and development as a young engineer.

What are you learning during this internship and do you think you have learned what you intended to learn? Have you received support from your working environment eg. from Field staff, as well as Yangon Office Staff when you are in need of their support during internship?

This internship at MPRL E&P allowed me to truly experience and understand how a producing oil field operates. The different sections we were assigned to at Mann Field included HSE, production measurement (GoCs), pumping units, workover operations, pump service, casing swabbing operation, echo-dynamometer, downhole workshop, deepening operation, mud engineering, warehouse operations and mobile workshop. We were assigned to a different section every 2nd day with a different mentor each time. When we first arrived in the Yangon Office, we were given an assignment to work on for the duration of the internship. Basically, the assignment required us to study GreenZyme operations in order to propose suitable wells/criteria and present our findings. The support and guidance from the MPRL E&P staff was exceptional both in Mann Field and the Yangon Office. They were willing to help us with all of our queries and happily put up with our constant pestering. We would like to give our special thanks to Sayar Nyo And U Aye Maung Maung in particular, for putting up with our pestering. We would also like to give our thanks to the G&G Team and all other departments that have assisted us with our GreenZyme assignment. Everyone treated us warmly and welcomed us into the workplace with wide open arms. There is a sense of true companionship among the employees and I am very glad to have been a part of it even for this short period of time. Later on, I hope to find employment at a workplace that offers great companionship like MPRL E&P. Over all, this experience has allowed me to consolidate my knowledge on what I learned at Curtin University and experience the practical aspect of operations. I am very pleased to have carried out my internship with MPRL E&P. Once again, I would like to thank MPRL E&P senior management and all of its staff at both Mann Field and the Yangon Office for this wonderful experience. It is one that I will always remember throughout my career. I hope to maintain the friendships and connections I've developed during my stay here at MPRL E&P.

With Mr. Kit Huat Tay

When did you start applying for the Internship and when did you become an Intern? How did you find out about the Internship Program and get chosen as an Intern?

I first found out about the internship from my friend, Kyaw Thant Lin as his father used to work for MPRL E&P. He encouraged me to apply for the internship as MPRL E&P has a good reputation in offering internship programs for engineering students. I then began my application around mid-Oct 2017 where I sent my resume and other documents to the Country Manager, U Sithu Moe Myint for his consideration. In about two weeks' time, I received confirmation from U Sithu Moe Myint that my application was successful. At the same time, I received an email from Petronas Malaysia that my internship application had been successful as well. I chose MPRL E&P in the end because I believe that I can gain more practical hands-on experience with this internship. With the successes in oil production enhancement projects in Mann Field and the gas discovery in Southern Rakhine Basin, I believe that the expertise of MPRL E&P in the upstream sector will surely reward me with invaluable knowledge and experience. Moreover, I think that MPRL E&P's engagement with the local community, HSE practices that prioritize employees and commitment to protecting the environment show that MPRL is a responsible and sustainable company to which I have great admiration and is the kind of company that I liked to work with.

I communicated mainly with U Ko Ko and Sayar U Thu Nyo via e-mail to make arrangements for the internship shortly after the approval. After obtaining our business visa, I arrived in Yangon from Perth, Australia along with my friend, Kyaw Thant Lin on 4th Dec 2017 and started our internship formally on the next day (5th Dec 2017).

Please introduce your education background and other professional experiences, if any.

Growing up in Malaysia, I completed my high school education in Kuala Lumpur. Shortly after, I was awarded the National Precision Engineering Scholarship (NPES) by EDB Singapore and moved to Singapore to study a diploma in digital & precision engineering in Nanyang Polytechnic. During my diploma study, I was exposed to CNC machining, 3D prototyping and plastic injection molding techniques. Other than that, I have also gained mechanical skills such as CAD/CAM drawing. Upon graduating, I chose to put my tertiary education on hold and instead joined Yamazaki Mazak Singapore (a CNC machine manufacturer) as an assistant R&D engineer for about 21 months. My job responsibility included developing and managing customized software solutions, designing human-machine interface (HMI) for new product series and assisting in ISO standards documentation and implementation. The reason was to discover my interest in the broad engineering field and hone my skills as a young engineer. Ultimately, I have decided that my passion lies in petroleum engineering and therefore I moved to Western Australia to study at Curtin University. I am currently in my final year of bachelor's in petroleum engineering.

What are you learning during this internship and do you think you have learned what you intended to learn? Have you received support from your working environment e.g. from Field staff, as well as the Yangon Office Staff when you are in need of their support during the internship?

Prior to commencing my internship, I did not expect myself to be able to acquire all this knowledge and experience. This internship is truly an eye-opener for me as I got to learn and experience new things that weren't available in my undergraduate studies. In the Yangon Office, I studied about GreenZyme injection, which is used to increase production in old wells. I did not know about enzyme-based EOR before and I have gained a deeper understanding of production forecasting, particularly decline curve analysis while preparing for the GreenZyme analysis presentation. During my time in Mann Field, I learned that the implementation of HSE practices has managed to minimize the impact on the environment and local communities. These practices include formation water re-injection and the use of sludge and waste management compound to treat waste products. In terms of technical knowledge, I learned about production measurement in GoCs, pulling units, workovers operations, pumping unit maintenance, warehouse, CSR and deepening operations. After spending 28 days on the field, I am able to understand and experience the challenges faced in production enhancement for a mature oil field.

Throughout this internship, I received a great deal of support and guidance from both the Mann Field and Yangon Office staff. I have nothing but great comments on their friendliness and willingness to help even though everyone has their own busy schedule. During my short stay in Myanmar, I was able to experience everyone's hospitality and found a sense of belonging within the MPRL team despite the language barrier. I would like to take this opportunity to thank everyone for their patience and support during this internship. I would also like to especially thank my mentor for this internship, Sayar U Thu Nyo for his time and guidance.

As an Intern, how long will you be studying at MPRL E&P and please tell us your future plans after you have finished your studies?

The entire duration of the internship is about 10 weeks starting from 5th of December 2017, after which I will start my final year at Curtin University. I am currently weighing my options between the petroleum engineering disciplines such as reservoir, production and drilling. I hope to understand each discipline more so that I can make it as my career's choice. My short-term plan after graduating is to kick start my career as a graduate petroleum engineer. I aim to find a position in a forward moving oil and gas company with a good reputation and one that is willing to nurture fresh graduates. As part of the team, I am looking forward to developing a new set of skills and gain experience in leadership and team-building. My long-term goal will see me moving into a position of responsibility where I will be able to lead a team and transfer knowledge that I have gained to the next generation of young engineers. ■

M&AOSB Inaugurates its Corporate Social Responsibility Program in Nanttharpu Village Tract, Ngaputaw Township, Ayeyarwaddy Region

Thal Sandy Tun

Myint & Associates Offshore Supply Base Limited (M&AOSB), kicks off its inaugural CSR initiative to build a one-storey, 90' x 30' new school building in Nanttharpu Village Tract, which will host the offshore supply base (OSB). Nanttharpu Village Tract is home to a sub-middle school (Grade 1 to Grade 9) and has a student population of 318. M&AOSB completed a needs assessment with the intent to support the development of the education sector in the Nga Yoke Kaung region whereby children in the community will no longer have to commute far in pursuit of education.

In June 2017, M&AOSB received a permit from the Myanmar Investment Commission (MIC) to build and operate an OSB, which is a critical piece of infrastructure to support the burgeoning oil and gas activities offshore Myanmar. "Even though the OSB is yet to be built, M&AOSB has actively engaged local communities and assessed the prevailing situations regarding education, health, and livelihoods in order to begin investing in social programs. First and foremost, we have decided to invest in education as M&AOSB will soon require human capital to operate long term in the region," states Daw Kyisin Htin Aung, Corporate Affairs Manager.

M&AOSB is in its investment phase and it will be some time before any returns on investment are reaped. However, the company has committed to a CSR program that will, in every way, bring benefits to the host community.

A ground-breaking ceremony to commemorate the beginning of the school building construction was held on 25 January 2018, where government officials, local community members and M&AOSB representatives were present. Construction will be completed within three months and then transferred to the Ministry of Education. ■

M&AOSB Completes EIA for Proposed Offshore Supply Base

Kyisin H. Aung

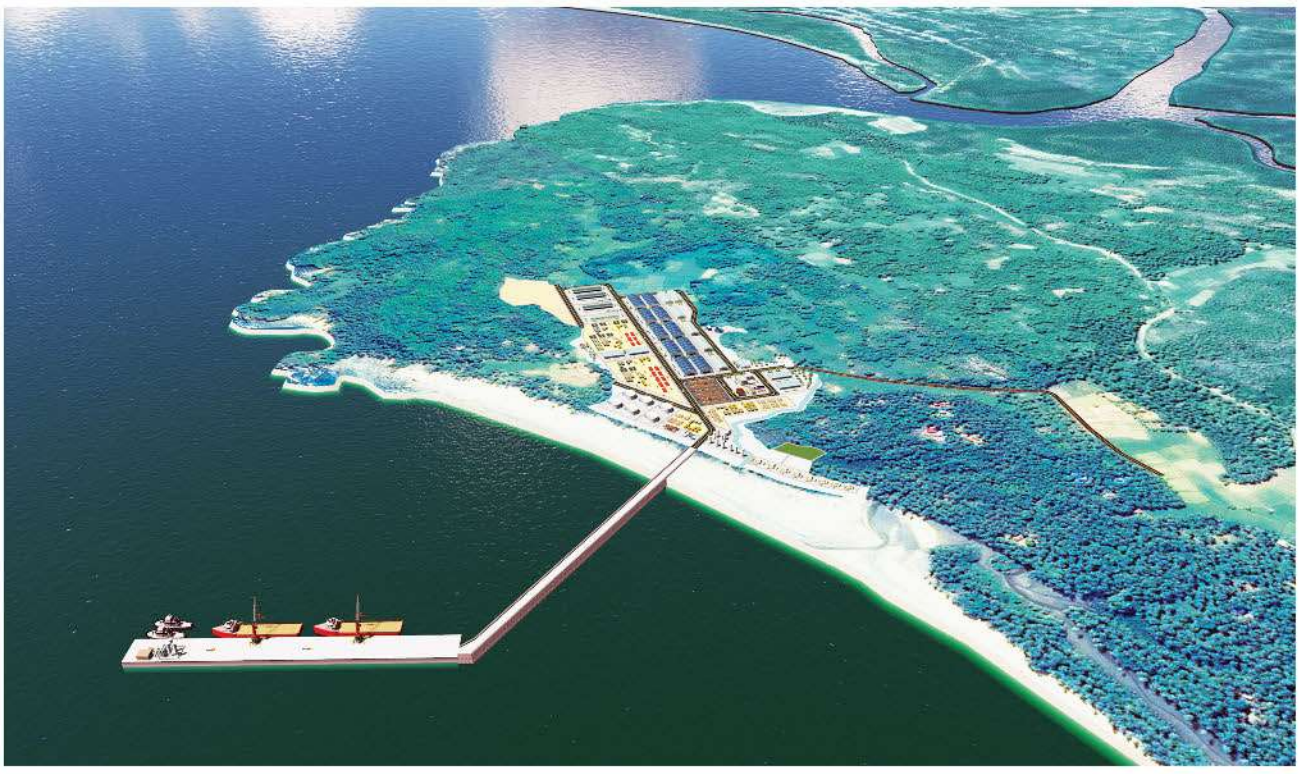
Myint & Associates Offshore Supply Base Ltd. (M&AOSB) has completed an Environmental Impact Assessment (EIA) of the proposed offshore supply base near Nga Yoke Kaung bay and submitted findings to the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC) for review. The EIA report details anticipated risks, impacts, and mitigation measures against potential negative impacts from proposed development activities.

Why do we need EIAs?

EIA is a tool to systematically safeguard the environment and people potentially affected by proposed development activities. It is important for M&AOSB to identify potential risks and impacts associated with the project early in order to effectively mitigate and protect the environment and the surrounding communities. A key element of an EIA is public participation. Firmly believing that EIAs should not be treated as necessary evil, M&AOSB has openly and repeatedly engaged local communities to capture concerns and feedback during the design phase of the project. We are fully conscious of the local environmental and cultural beauty of the area and intend to develop the supply base in a manner that has a minimal impact on the environment and lead to enhancement of the lives of the local communities.

How is it done?

The Environmental Impact Assessment Procedures (2015) prescribes strict standards for carrying out the EIA. We appointed a third party organization to identify, predict, and mitigate the biophysical and social effects of the proposed development. Going above and beyond the EIA requirements for two public consultations, we have communicated to stakeholders project progress on an ongoing basis



and at key milestones, such as when we received approval from the Myanmar Investment Commission. We have also captured concerns and feedback through the M&AOSB Operational Grievance Mechanism (OGM), which is designed to respond to community complaints. Through repeated consultative process and listening to our stakeholders, we learned that community members were rightly concerned about, to name a few, environmental pollution, impact on livelihoods, and impact on their freedom of movement. They also had positive expectations that the proposed project would create jobs and bring social investments to the project area. We have also learned of community concerns and feedback through our community-based volunteers. We believe that it is important to educate members of the local community whom the majority of the community trusts to communicate progress. We believe that it is good business to responsibly manage environment and social effects from our operations and, hence, have committed to managing them effectively in the proposed Environmental Management Plan (EMP) and Social Management Plan (SMP).

What's next?

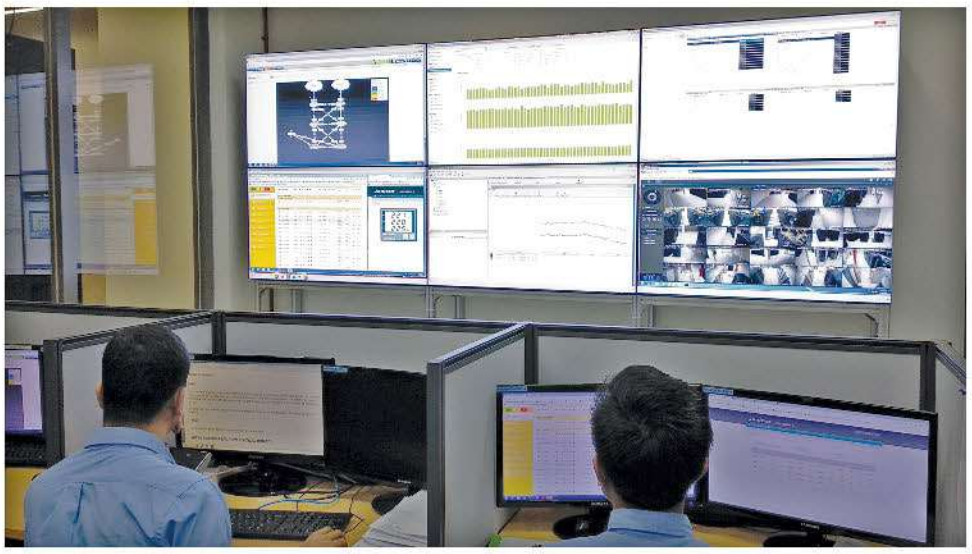
We are now in the disclosure phase and have submitted assessment findings to the government and public for comments. Comments from these stakeholder groups will be taken into account to finalize the mitigation measures and obtain an Environmental Compliance Certificate. We do not believe that receiving regulatory approval is the end of the road. It is just the beginning as we will strictly adhere to environmental and social management systems to protect the environment and people as long as the supply base is in operation. ■

M&A Data Center : the Essence of Myint & Associates Telecommunications

Zune Min Latt

Today's organizations are more reliant on digital data and these data are required to be kept in an accessible, secure, and reliable environment. Hence, data centers are fast becoming the backbone of the digital economy as well as the standard for use by financial institutions, government ministries, and by the organizations where data availability is critical. M&A Data Center, owned and operated by Myint & Associates Telecommunications Ltd., is the first data center in Myanmar to receive Tier III Design Certification from the Uptime Institute, the global data center authority based in the United States. Uptime Institute is the IT industry's most trusted and adopted global standards for the proper design, build and operation of data centers.

M&A Data Center is located at the Vantage Tower, a property designed to withstand earthquakes of up to a magnitude of 7.2 on the Richter scale and wind speed of up to 120 miles per hour. Designed with the N+1 concept, M&A Data Center is equipped with double redundant power systems, backup generators and UPS to assure the power reliability. Such concurrent maintainability features allows for any of its components to undergo any form of maintenance even while the facility is in operation. Computer Room Air-Con Units (CRAC Units) are installed to keep the equipment under standard temperature and humidity controls. Water Leakage sensors, Air Flow sensors and Very Early Smoke Detection Apparatus (VESDA) are installed for environmental monitoring and FM 200 (Nitrogen Gas) is used for the fire suppression system.



With all these state-of-the-art facilities installed, M&A Data Center offers international standard Service Level Agreements (SLAs) which include penalties that the data center will incur should the agreed services expectations not be met. Being a Tier III Design certified data center, the facility offers 99.98% operational time service guarantee (uptime) per year meaning the annual downtime is not more than 1.6 hours. Now in operation for over 2 years, M&A Data Center boasts zero second downtime. With multiple layers of security access, the physical security is one key feature M&A Data Center guarantees, as well.

The operations are managed by the skilful network and facility engineers from the 24/7 network operations center (NOC). Along with the managed services for the data center, NOC engineers also perform remote hand and remote operation services for the clients with specific needs. With the capacity to provide 90 racks of server colocation space, M&A Data Center offers 3 types of colocation services – rack colocation, open space colocation and cage unit colocation.

Being a carrier-neutral data center, M&A Data Center is not tied to a single service provider, providing diversity and flexibility for the client seeking interconnection service between multiple telecommunication carriers and/or colocation providers. In addition to its carrier neutrality, M&A Data Center is teeming with PoP allocations by national and international carriers plus internet service providers such as Singtel, Campana, NTT Communications, Ooredoo, Frontiir, Fortune Broadband, AGM Communications, etc.

Since April 2017, M&A Telecoms have entered into a resale agreement together with NTT Communications Thailand (NTTCT). The agreement enables NTTCT to resell colocation space, available from M&A Data Center to their clients and customers, under a new brand name referred to as Yangon Kamayut Data Center. This initiative enhances M&A Data Center's services to extend outside of Myanmar, leveraging NTTCT's reputable brand name and international clientele. Despite the collaboration with NTTCT, one of the internet service providing companies, M&A Data Center remains as a carrier-neutral data center.

M&A Data Center has recently achieved the compliant for the colocation and the physical security of the Payment Card Industry Data Security Standard (PCI DSS). Administered and managed by a consortium of the major payment card brands – Visa, MasterCard, Discover, American Express and JCB – PCI DSS is a stringent set of security requirements and protocols established to protect the cardholder information from credit card fraud. Qualified Security Assessor (QSA) from Trustwave Holdings, Inc., a provider of information security and compliance solutions, audited and assessed M&A Data Center according to the PCI DSS's established guidelines. The assessment includes company policies and procedures, facility physical access controls and logging, CCTV, employee/visitor badging and logs. We have proven and verifiable PCI compliance in the form of assessment results in an Attestation of Compliance (AOC) and Report on Compliance (ROC). With this latest compliancy with PCI DSS, financial institutions and companies processing with payment cards are assured that their IT infrastructure hosted within M&A Data Center can enable safe and secure financial transactions.

With the fast-paced advancing technologies in the industry, an impressive roadmap has been laid to broaden M&A Data Center's services. As the Cloud Computing and VPS services are in demand for Myanmar's thriving telecommunications market, M&A Data Center anticipates to deliver its first Cloud services in the future. Establishing of National Internet Exchange is in plan as well to provide a peering for all the ISPs. ■

Occupational Safety and Health in Mann Field

Dr. Nyi Win

Occupational safety and health, also commonly referred to as occupational health and safety, occupational health, or workplace health and safety, is a multidisciplinary field concerned with the safety, health, and welfare of people at work. - **Wikipedia**

Occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards. The health of the workers has several determinants, including risk factors at the workplace leading to cancers, accidents, musculoskeletal diseases, respiratory diseases, hearing loss, circulatory diseases, stress related disorders and communicable diseases and others. - **WHO**

In the oil and gas industry, workers routinely come in contact with heavy machinery, hazardous materials, and chemical byproducts—exposures that can put them at significant risk for occupational disease (OD).

Top Occupational Health Hazards in the Oil and Gas Industry are:

Hydrogen Sulphide

Although not present in significant amounts at Mann Field, H_2S is a really toxic gas without color and a rotten egg smell and can lead to fatality if exposed in significant amounts.

Drilling Fluids

During drilling, a high volume of drilling fluids is pumped and circulated through the well and into systems that are open, partially enclosed or completely enclosed at elevated temperatures. When those fluids are agitated, because they are during part of the re-circulation process, workers may suffer significant exposure and subsequent health effects.

The effects from this occupational health hazards comprise of dizziness, drowsiness, headaches and nausea (commonly associated with hydrocarbon exposure) and dermatitis and sensitization due to repeated skin contact with drilling fluids. Additionally, exposure to oil mists can induce irritation and inflammation of the respiratory system. Some mildly refined base oils have also been related to cancer owing to aromatic compounds in oil mists.

Workers spending a considerable portion of their shifts exposed significantly to hydrocarbons and oil mists are found at:

- Drilling floor
- Mud pits/tanks
- Shale shakers
- Chemical mixing station/room

Silica

Silica is a fundamental component of sand and rock. Some typical silica-containing materials include:

- Concrete, concrete block, mortar, cement
- Granite, sand, top soil, fill dirt
- Asphalt (containing stone or rock)
- Abrasive for blasting
- Hydraulic fracturing sand (contains as much as 99% silica)

Prolonged breathing of fine crystalline silica dust will cause silicosis disease where they may suffer breath shortness, severe cough and weakness. Those symptoms can become worse over time and induce death. Crystalline silica exposure has also been associated with lung cancer.

Workers are at risk of breathing the silica dust during:

- Abrasive blasting using silica-containing products
- Drilling using dry product additive that contain quartz
- Cementing operations
- Shale dryer maintenance (dry particulate may comprise quartz)
- Hydraulic fracturing (loading, unloading, moving or storing sand)
- Sweeping or moving sand or gravel that contains silica

Mercury

Mercury is a natural component of oil and gas, and may have high concentrations in some formations. The mercury can be released from geological deposits by heat and pressure, and then migrated to oil and gas traps as a vapor.

Long term exposure to high concentration of mercury vapor does harm to the central nervous system and can induce tremors, stupor, nervousness, personality changes, vision and hearing problems. Contact with mercury can also impact kidneys and lead to irritation and skin and eye burns.

Diesel exhaust

Diesel engines give power to plentiful types of heavy equipment, vehicles, diesel generators and other apparatuses used in the oil and gas industry.

The exhaust from those engines comprises a mixture of gases (carbon monoxide and oxides of nitrogen to include) and small particles that can do harm to workers' health. Some of those particles have carcinogenic chemicals (known as aromatic hydrocarbons) attached to their surfaces.

Short-term exposure to the diesel exhaust can lead to irritation of eyes and upper respiration (nose and throat). Long-term health problems can be respiratory disease, lung cancer, and cardiovascular problems.

Naturally occurring radioactive materials (NORM) are known as radioactive elements present in the earth's crust and naturally found in the environment. Those materials include uranium, radium, thorium and radon. Though the background concentration of NORM is commonly low, NORM may be present at higher levels due to human activities.

In the oil and gas industry, NORM may appear in liquids and gases from several geological formations.

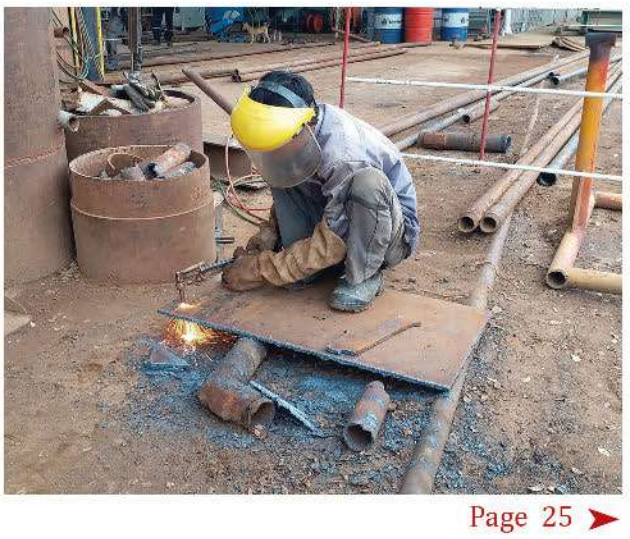
Confined spaces

A confined space is a (partially) closed area that is big enough for an employee to enter. It's not intended for someone to work in regularly though, and oil field workers may need to enter that confined space for such tasks as inspection, cleaning, maintenance and repair. A high opening, a small opening or a lay-out with obstructions can make entry and exit hard and rescue procedures complicated.

Entry into the confined space can be very dangerous. Employees must not be permitted to enter it unless equipment, proper training and procedures are all in place. Workers have died as they didn't know they were entering a confined space with a dangerous atmosphere, and thus didn't take the necessary precautions.

Confined spaces are typical in the oil and gas industry, especially in processing operations. Confined spaces can be:

- Storage tanks
- Boilers
- Process and reaction vessels
- Ventilation and exhaust ducts
- Pipelines
- Tunnels and pits



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Hazardous noise

Noise-induced hearing loss (NIHL) is permanent hearing loss due to long-term exposure to hazardous noise. The noise intensity and the exposure duration determine the severity of hearing loss.

Sources of hazardous noise often found in oil and gas sites include:

- Mud pumps and tanks
- Offloading, main oil, and cement pumps
- Shale shaker/centrifuge
- Gas compression and water injection
- Derrick, dog house and pipe decks
- Fracturing
- Air system and air tugger
- Diesel/gas turbine power generators

In accordance with **MPRL E&P's HSE Policy** of:

- Zero accidents
- No harm to people
- Minimal environmental impact

Occupational illnesses are being prevented or minimized by improving the Safety Culture and Safety Knowledge with HSE Trainings, Safety Meetings, Tool Box talks, Job Safety Analysis and pre-job JSA discussions, use of Personal Protective Equipment PPE, CARE Card system and Supervision at various levels.

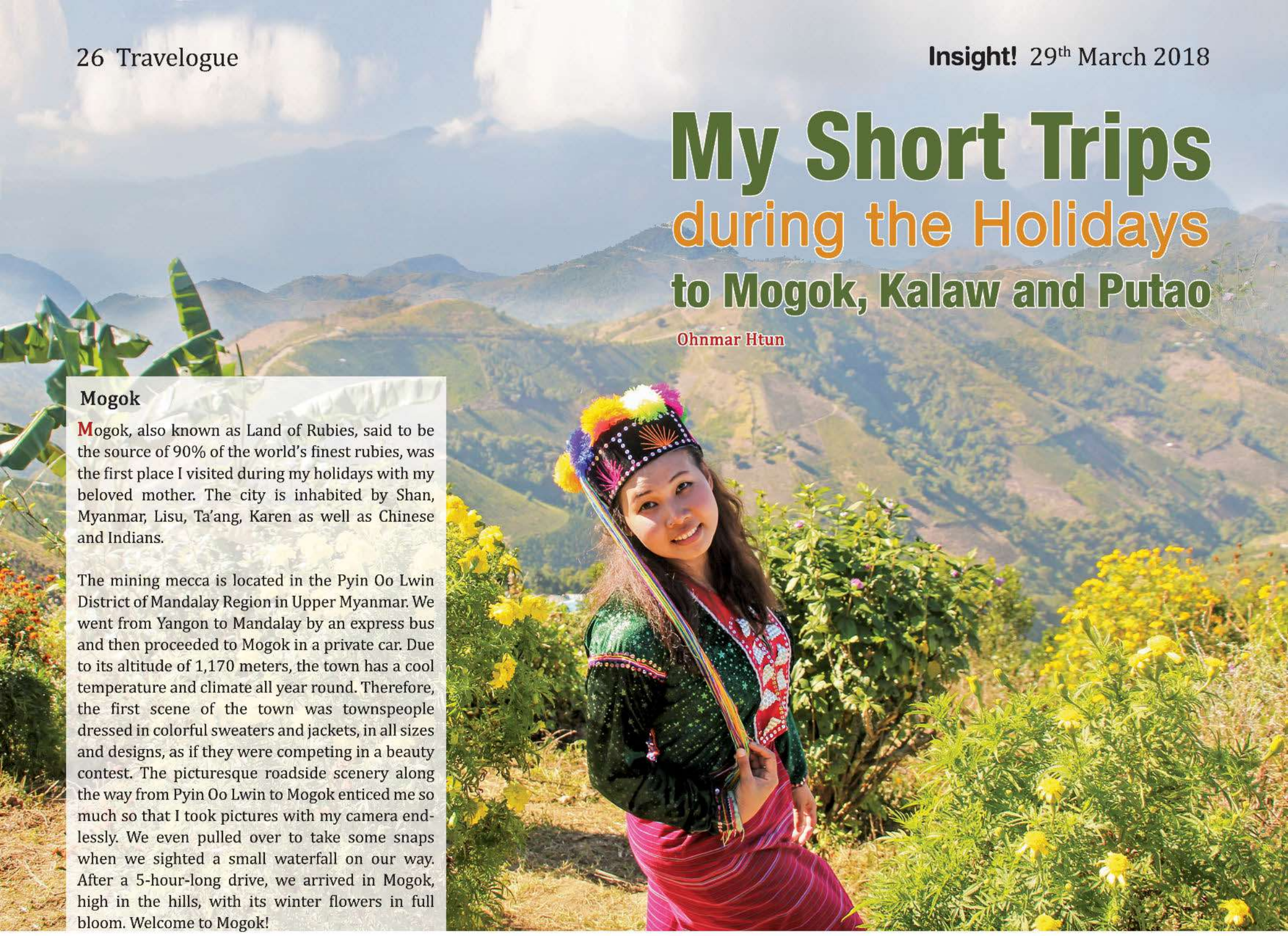
The standard and special PPE (Personal Protection Equipment) used to protect against Occupational diseases in Mann Field include but are not limited to the following: Hard hats, Safety Glasses, Face shields, Welders face shields, Dust masks, Fume respirators, Spray paint respirators, SCBA Self Containing Breathing Apparatuses, Ear plugs, Ear mufflers, Coveralls, Disposable coveralls, Acid resistant splash proof coveralls, Work gloves, Acid resistant gloves, Rubber gloves, Electrical gloves, Safety boots, PVC safety boots, Climbing belts and harnesses, Derrick belts, and Fall arrest devices. ■

"The efficient management of OSH risks is best achieved by instilling a safety culture within the organization, adopting a preventive approach, utilizing risk management and control principles, aligning OSH management systems with other business operations, involving all at the workplace and respecting minimum legal standards."

Earthquake Drill at Vantage Tower

My Short Trips during the Holidays to Mogok, Kalaw and Putao

Ohnmar Htun



Mogok

Mogok, also known as Land of Rubies, said to be the source of 90% of the world's finest rubies, was the first place I visited during my holidays with my beloved mother. The city is inhabited by Shan, Myanmar, Lisu, Ta'ang, Karen as well as Chinese and Indians.

The mining mecca is located in the Pyin Oo Lwin District of Mandalay Region in Upper Myanmar. We went from Yangon to Mandalay by an express bus and then proceeded to Mogok in a private car. Due to its altitude of 1,170 meters, the town has a cool temperature and climate all year round. Therefore, the first scene of the town was townspeople dressed in colorful sweaters and jackets, in all sizes and designs, as if they were competing in a beauty contest. The picturesque roadside scenery along the way from Pyin Oo Lwin to Mogok enticed me so much so that I took pictures with my camera endlessly. We even pulled over to take some snaps when we sighted a small waterfall on our way. After a 5-hour-long drive, we arrived in Mogok, high in the hills, with its winter flowers in full bloom. Welcome to Mogok!

We decided to stay at a hotel which featured a scenic view of the town skyline, called Mogok Hill Hotel. The service of the hotel staff was of supreme quality, making us definitely feel at home. As promised, the location of the hotel was ideal to have our breakfast while enjoying the morning beauty of the sleepy little town.

Bernard Village

Bernard Village is a popular place frequented by many tourists visiting Myanmar, later attracting the attention of local travelers. It is located in the west part of the town. In winter, the village freezes most of the time. Going early to see the freezing and feasting your eyes on the sky where the sun rose out of a sea of clouds on the way back was a priceless experience. I want you to make sure that you watch the sun rise on your way back if you ever happen to visit this area.

Mogok Gems Market

We also paid a visit to Mogok gems market early in the morning. The gems market was close to the hotel we were staying, so we just walked there. Although it was still early in the morning, the gems market was already crowded with both buyers and sellers. I was glad to have a chance to appreciate the world-famous gemstones of the city first hand. I hope they will bring prosperity and peace to the country in future.

Orange Plantations

Have you ever picked an orange yourself?

I did! We were able to drop in on an orange plantation which allowed visitors to experience picking oranges themselves with a bucket. It was unforgettable!

Your trip would not be complete or perfect unless you try out the local foods!

I would like to recommend that you try Mogok Steamed Rice but don't think it's like the steamed rice in Yangon. Actually, it means Mogok Rice Salad. What a delectable dish! One could feel satisfied with just one plate.

At the night market, the smell of Kaw Bouk being roasted with charcoal fire was toothsome to me. Delighting in the Kaw Bouk packed in a banana leaf and clinging to my mother's hand, made visiting the night market enjoyable. The end of the stay in this lovely town was marked with a collection of random shots of people and things I could see on the way back to Yangon.

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Trekking in Kalaw

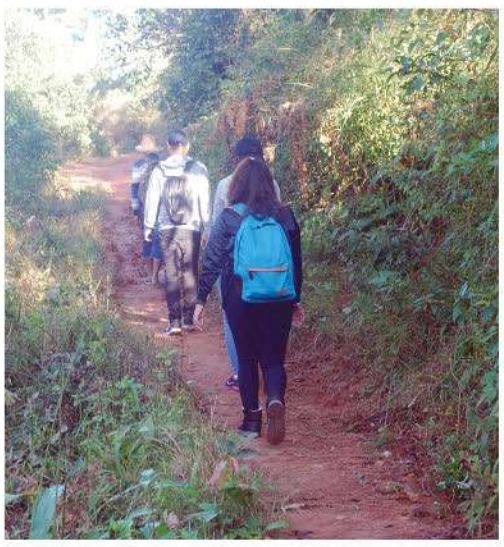
My mother and I set foot for the first time in Kalaw which is a cozy small town located above 4,200 feet above sea level following a ride on a Yangon-Kalaw express bus. Our arrival coincided with a cold wave hitting the town. As a result, it was really really cold! Kalaw was a place where you would just be content with a cup of coffee and a bag of hot water. Without a fridge nor an air conditioner.

We stayed at a hotel called Eastern Paradise Hotel whose staff were well-trained and showed off great hospitality as if we were their family.

We already contacted the Trekking Information Centre to arrange our trekking in Kalaw even before we arrived. Therefore, we could go on a one-day trekking trip next morning right away. Our trekking trip involved not only walking among valleys and mountains but also studying the daily life and traditions of local villages and ethnic peoples. Things you should carry in your trekking trip are a jacket, a water bottle, sunglasses, and walking shoes.

Trekking used to be a practice enjoyed largely by foreigners but no longer, as it is now popular with locals too. We left the hotel at 8 in the morning together with the trekking guide. After walking for an hour, we approached the foot of the mountains. We walked along the path surrounded by the pine trees for some hours, mindful to breath in and out the cool, clean breeze. Soon the landscape ahead was of green plantations, bushes and trees naturally growing.

The return trip was a bit difficult as most of the time we struggled to walk sideways and not to stumble down the mountains. We used a short cut which proved to be an adventure later. Although I was sweating and feeling drained, I managed to smile when taking pictures. Arriving at the foot of the mountains, I looked back and felt a wave of thrill for I had been to the top of these mountains.



This was the real beauty of nature, I thought. Trekking in the woods with a backpack and a water bottle offered a rare, unique relaxation opportunity for someone who came from a crowded, noisy city. We walked along the narrow path up the mountains amid the green fields and forests and we picked up and ate some fruits we found on our way.

At 11, we arrived at our first rest spot, called Cool Water Pond. I was surprised to find no trash in the Pond. It was such an exhilarating experience to manage to walk on the bamboos.

Although we were tired it was wiped away by the tea plantations at the top of the mountains. The tea trees were grown long ago, said the trekking guide. Then we reached View Point where we found ourselves to be exhausted and very hungry. It was already past lunch time and we devoured all the foods served on the table such as Paratha, potato curry and oranges. While we were having a rest, I had a memorable picture wearing Ta'ang traditional dress.

Bike Tour in Putao

Saying the name "Putao" evokes a town surrounded by snow-capped mountains in the northernmost part of the country. After flying for about an hour from Myitkyina, we arrived in Putao where we stayed at a hotel called Hotel Putao. On the second day, we hired bikes from the hotel to have a day of bike touring to Mulashidi Bridge. Most local visitors use a car to visit the area rather than a bike tour. After leaving the Hotel, we dropped by the Putao morning market where fresh vegetables, traditional medicines, herbs and sambar deer meat were abundantly available for enthusiastic shoppers. The way to Mulashidi Bridge had fallen under a blanket of mist and snow. It was such a wonderful feeling to ride the bike in those mist and snow.

I even took selfies with some lovely Lisu girls that I met on my way. The view of the ice-capped mountains in the distance, warm smiles of local people as we passed each village, riding the bike carefully along the steep descent down the road with butterflies in my stomach, sighting Mulashidi Bridge at the end of all the excitement were all unforgettable memories for me. After parking my bike and stepping up on the Bridge, the scenery I found was beyond words. The ride was worth it, I realized.

The return ride was all going uphill and as a result, a bit tiresome. I met with some intrepid people who were coming back from climbing the snowy peaks. After some hours, we reached the hotel, feeling both exhaustion and happiness. I would love to visit Putao again where the smiles of local people will warm your heart against its cold weather. ■

Yoma Yangon International Marathon 2018

Discover Sailing & Trash Hero Inya Lake with Network Int'l School

37th Singapore Open Windsurfing Championship 2018

SUP Beginner Clinic & Junior Sailing Clinic at Yangon Sailing Club (YSC)