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Do you want peanuts with that?

by Uri Nooteboom



Most of my travel is international and I had not made any long-distance domestic flights for a while. When I was asked to pay \$22 for a meager meal on a recent flight, I was quite surprised and then annoyed. It wasn't the \$22 that bothered me, which is small potatoes when you are already paying handsomely for a miniature space that only a contortionist can feel comfortable in; it was the feeling of being ripped off.

A \$22 difference in the price of a \$1,000 airfare is noise and quite frankly immaterial to most people. On the other hand having to pay \$22 on that same flight for substandard food becomes an insult because it is evident that it is vastly overpriced. Most people are probably not able to assess the real cost and intrinsic value of a seat on the plane, but they are able to assess the real value of that meager meal. The immediate reaction to that overpriced meal is "if I am paying 5 times what this meal is worth, how much is this seat really worth?"

I know that margins in the airline industry are paper thin and airlines are cutting costs in a ferociously competitive and marginal market. However, changing the optics of the fare and moving a couple of bucks from the seat to the meal, or taking basic expected amenities away and then charging for them pretty much destroys trust; and customer satisfaction,

if there was any left, goes out the window. Clearly if I were running an airline I would offer everyone free drinks and a decent meal to set myself apart from the competition and create a more pleasant flying experience; and I would be able to sell a better experience and increase my fares by more than these amenities are worth individually. Wouldn't you prefer that airline?

But wait; I am digressing and oversimplifying what must be a complex business that I know nothing about. What I do know is that our industry would not be able to survive in airline mode. We wouldn't be able to survive without the trust of our customers; their acknowledgement that we are offering value and creating value to their projects. Value is not the same as price. That is why I drive a "driving machine" rather than the scooter I would buy if I were simply looking for cheap transport.

I don't expect our industry will devalue itself to airline mode; too much is at stake to lose sight that technology, safety and quality are not commodities that we buy on eBay. If it ever would come to that, we and the rest of the industry would be in serious trouble.

In the meantime, we continue to offer full service including the full complement of knowledge, know-how and experience steeped in an unbeatable HSE culture and backed by first class engineering and management processes wherever required by our customers and projects. You wouldn't expect less from us.

We will even include the "peanuts."



We wouldn't be able to survive without the trust of our customers; their acknowledgement that we are offering value and creating value to their projects. Value is not the same as price.



Ultra-deepwater Brazilian Project Demands Innovation and Engineering Excellence

by Charles (Chuck) White

After many years of technology development efforts, Petrobras initiated a Design Competition in 2009 for the engineering and delivery of four (4) massive submerged buoys in waters over 2100m deep. The buoys are conceived to perform a key role in the development of two fields by serving as a near-surface support point for dozens of flowline risers and umbilicals. Using the buoys as an intermediate support below wave zone allows rigid steel pipes to bring production from the seabed to near the surface as a low cost alternative to pricey, complex flexible pipe risers. Relatively short lengths of flexible pipe risers can then be connected to complete the flow path to the FPSO. These flexible riser "jumpers" are capable of withstanding the dynamics imposed by the motions of the FPSO in the rough waters of the Santos Basin south of Rio de Janeiro.

Petrobras held the Design Competition as part of its vision for developing at least 10 huge ultra-deepwater fields off the coast of Brazil over the next decade. The two innovative projects comprising this first competition/contract are considered "pilots" - leading the way for tens of billions of dollars of investment and potentially hundreds of billions of dollars of total cash flow.

The two innovative projects comprising this first competition/contract are considered "pilots" - leading the way for tens of billions of dollars of investment and potentially hundreds of billions of dollars of total cash flow.

INTECSEA supported one of the leading competitors in this Design Competition

- a company that is today called Subsea 7. During the competition, INTECSEA helped Subsea 7 create an innovative hull form and vertically tethered mooring system. Subsea 7 invented a means for efficiently transitioning from the rigid SCRs to the flexible jumpers, which was recently nominated as a finalist for award for innovation at the 2012 Offshore Technology Conference (OTC). Subsea 7, a dominant player in the offshore installation industry with a fleet of over 40 vessels and 150 ROVs, eventually won the contract - at over \$1bn, their first major EPCI contract - and engaged INTECSEA for detailed engineering of the buoys and tether systems.

Under the contract, nearly 50 INTECSEA employees have been mobilized at various stages since April of 2011. As Project Manager, Yun Ding has been responsible for mobilizing an engineering team comprised of widely experienced resources to meet the challenging schedule milestones and evolving challenges. Yun notes that "With the shipyard wanting to start cutting steel within eight months after project kick-off, INTECSEA needed to engage some of our most highly experienced professionals."

Currently, the project is holding to the ambitious schedule of delivery from the yard in Q4 2012 and installation at the field in the first half of 2013. Yun Ding also expects that, while the main detailed engineering contract is nearing completion, Subsea 7 will want to keep INTECSEA involved in a few key consulting support roles up through the challenging installation activities.

As Lead Naval Architect on the project, Dr. Chunqun Ji has been directly responsible for helping Subsea 7 come up with a highly unusual hull form for what is essentially a "submerged TLP." Dr. Ji explains, "This buoy is a submerged TLP with eight tethers and a payload comprised

of risers and the multitude of appurtenances required to support the risers, external ballast piping system, and distributed monitoring systems. Weight control is a key consideration, especially when dealing with submarine stability."

Engineering Manager for the project, Chuck White, has paid particular attention to the engineering and design of the innovative vertically tethered mooring - a mooring in which the "tendons" are comprised of both chain and wire rope. While the idea behind Petrobras' near-surface buoy concept is to isolate the SCRs from the FPSO motions, the jumpers do transfer those dynamic loadings to the buoys in a way that can excite significant responses on the side where the jumpers are supported. Chuck comments, "This makes for some interesting dynamic behavior that has required careful evaluation by both Subsea 7 and INTECSEA."

In addition, the end connections for the tethers incorporate many innovations, including the use of both temporary tethers and removable chain tensioners to enable fast, efficient installation.

For this "submerged TLP", getting it and its payload installed provides very special challenges. First, when the buoys are ready they will be towed individually from their safe

(continued on page 6)



Currently, the project is holding to the ambitious schedule of delivery from the yard in Q4 2012 and installation at the field in the first half of 2013.



Brazil Project (continued from page 5)

harbor locations (where final outfitting and commissioning are performed) to the remote fields in the deep waters south of Rio. This towing operation must be performed carefully over several days through open South Atlantic seas. Once positioned near the main installation barge, hoses will be attached which enable the ballasting procedures that submerge the buoy. The depth of submergence of the buoy is controlled both by ballasting operations and pairs of "lowering chains" attached to tugs on either side of the buoy. According to Subsea 7's top team leaders, this operation is the most critical part of the project as the buoy must be lowered to its targeted installation depth of 250m in steps of no more than about 20m each. Lowering the buoy all the way to its target depth in one step would cause catastrophic implosion of the hull. In fact, Yun Ding and Structural Lead Dr. Yonggang Zhang confirm that "unlike any other TLP, installation of these buoys is the primary driver in many key aspects of the design."

As a result of the criticality of ballasting operations and the various installation steps, INTECSEA's marine systems and structural appurtenance engineers have been intimately involved with Subsea 7's engineering and installation teams. The ballasting and stability considerations have led to a highly compartmentalized hull with a complex arrangement of external piping beneath the hull. Structural Engineering Specialist Zujin "Richard" Hang and Marine Systems Engineer Garabed Srabian have worked closely to design and structurally support the external piping and

ROV interface system. Richard has also worked with LA Foster to design a perimeter defense structure to protect the exposed piping during tow out to the field.

Garabed Srabian has noted, "The fact that this submarine TLP is operated without direct human intervention means that designing for the ROV interfaces is critical." LA Foster seconds that comment noting that all the many "hundreds" of appurtenances must be designed with consideration of ROV accessibility and the potential for snagging ROV cables. The exposed piping and unusually large number of appurtenances have created a real challenge for designing the external corrosion protection system. As lead for the cathodic protection design, YT Kim says "Even the chain of the tethers must be considered. So, as a result, the exterior of the buoy is virtually covered with aluminum anodes."

Construction is currently underway as the last details of the design are finalized. INTECSEA is closely involved in supporting the construction activities at the Qingdao Wuchuan Heavy Industry (QWHI) yard in China. Dr. Zhang has spent many days in the yard with the Subsea 7 construction team to ensure efficient initiation of construction and resolution of queries.

Subsea 7's experience with and confidence regarding the imminent success of the current project has poised the company for a new project competition announced by Petrobras at the end of 2011. INTECSEA is looking forward to building on our relationship and recent success with Subsea 7 to help Brazil realize the value of their deep water resources.



BPTT Slab Valve Recovery Project is a Success for INTECSEA and WPTL

by Uwa Eigbe

INTECSEA and WorleyParsons Trinidad Limited (WPTL) recently worked together to resolve a high-risk issue on BP Trinidad and Tobago's (BPTT) Cassia A platform. In early 2011, BPTT reported a defective slab valve on the riser piping of the Cassia A platform located in 73m of water, offshore Trinidad. The slab valve was installed temporarily in late 2009 to facilitate a hot-tap isolation of the riser piping and enable the installation of a new Emergency Shut Down Valve (ESDV) on the platform. The situation posed a high risk to BPTT and the operation of the platform, due to the potential release of hydrocarbons from the valve. To eliminate the risk, BPTT requested that INTECSEA and WPTL perform *Select* phase engineering studies for several options for the removal of the defective slab valve starting in September 2010. BPTT, pleased with the work done on the previous phase, further awarded INTECSEA and WPTL the Define and Execute phases. The phases of this project were executed mainly out of the INTECSEA Houston office, with support personnel located in WPTL and BPTT offices in Trinidad.

The Define phase scope of work provided engineering and field support assessments including detailed methodology and procedures, a project execution schedule, as well as cost and risk estimates for the valve removal options. The Execute phase, which began on October 1, 2011, included the review and implementation of offshore procedures, project schedule monitoring, updating, cost tracking and reporting, and implementation of Management Of Change (MOC) and project close-out procedures.

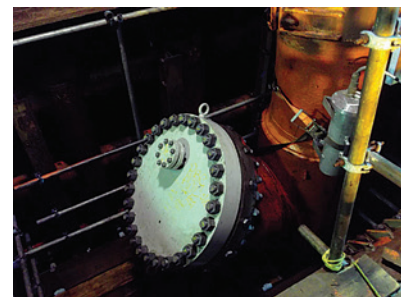
The Execute schedule for the slab valve removal was primarily driven by the highly restrictive operational weather window offshore Trinidad. If the slab valve would not have been effectively removed before the end of November 2011, adverse weather conditions would not have permitted the operation to resume until May 2012. Time was of the essence and the team did a great job in overcoming challenging conditions to keep on schedule and budget. The final phase of the project recently came to a close after an isolation plug was inserted into the 30" pipeline to isolate the slab valve section from the gas-filled pipeline. This allowed the project team to remove the slab valve with zero environmental or safety-related incidents.

The successful completion of all phases of this project was crucial for BPTT, as INTECSEA and WPTL teams were able to eliminate a significant risk to their company. Bob Fryar, Executive Vice President of E&P Production for BP, summed up the importance of this project saying "Congratulations on removing BPTT's top risk. I know this was quite a project and I also know that everyone must be hugely proud of this accomplishment. This is what [BP] means by safety as one of our values and it reinforces the focus that you have placed on risk management. Please pass on my thanks to the entire [INTECSEA/WP and WPTL] team. Really well done."

Craig Wiggs, Operations Manager for BPTT, also recognized the "great leadership" and "outstanding planning and execution" shown by members of the INTECSEA and WPTL teams.

Exceptional project delivery continues to be a vital part of the overall growth strategy for INTECSEA, so great job to the team for setting the precedent and making this project a huge success!

Slab Valve Recovery Operations on BPTT Cassia A Platform



Arctic Floaters

Sea ice, icebergs, icing, darkness, coldness and a lack of infrastructure are some of the main challenges associated with producing Arctic oil and gas.

by Benny van der Vegte

The offshore industry is gradually entering the more remotely situated areas of the world as the mature oil and gas provinces deplete and the worldwide energy demand continues to rise at a steady pace. The move to deeper waters was a first step in unlocking new resources, and the focus is now also set on the Arctic as recent studies indicate that this region likely holds more than 25% of the world's remaining oil and gas reserves.

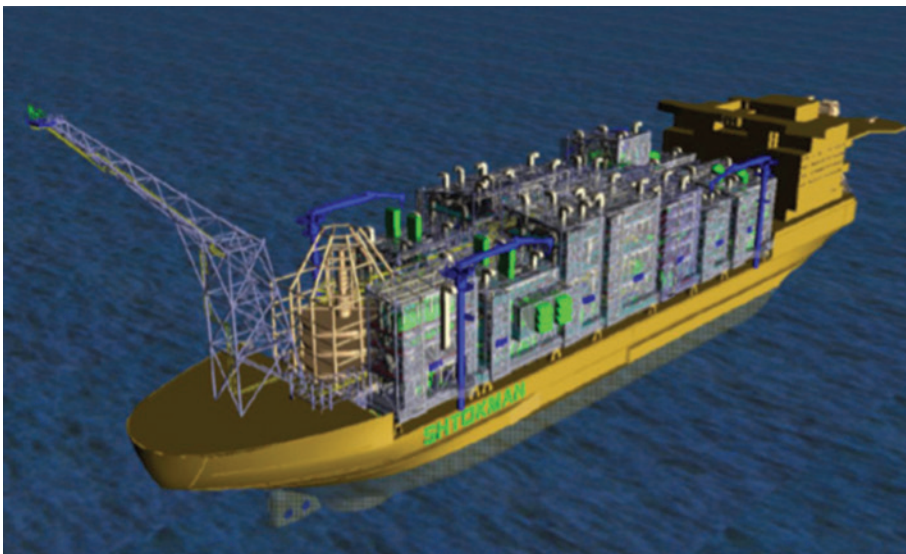
This energy however comes with a price. Sea ice, icebergs, icing, darkness, coldness and a lack of infrastructure are some of the main challenges associated with producing Arctic oil and gas. Additionally, some of these conditions, such as the presence of sea ice, can be highly variable and difficult to predict, not only in terms of location but also in terms of time. On one day the facility could be situated in open water, while on the next day it could be in the middle of an ice field experiencing high loads from 2m thick ice sheets. This is especially the case in sub-Arctic regions where the ice conditions are highly dependent on the seasonal expansion and retraction of the ice cover. Together with the driving forces of the wind and current, these areas can have highly variable ice drift conditions.

It is in these high variable conditions that floating platforms can provide a safe and flexible solution. Especially in environments with extreme sea ice conditions or icebergs, the only way to assure the integrity of the floater may be to disconnect it and move it temporarily away from site. Such disconnections should of course be kept to a minimum, which is why it is beneficiary to optimize the design against the ice conditions maximizing your operating window.

The shape of the vessel is one of the most important parameters in the ice performance of a floater. A round shaped floater with inclined side panels at the waterline can be effective as it breaks the ice efficiently. The round shaped floater will behave the same for all ice drift directions. A disadvantage of a round shaped floater could be poorer performance in open water. A ship-shaped floater with a turret near the bow enables the floater to ice-vane, effectively minimizing the required station keeping forces. During reversal drift events however, these floaters will require high station keeping forces as ice loads will come in from the side of the vessel. The Terra Nova and the White Rose FPSO operating at the Grand Banks have the ability to weathervane, but are only designed to operate in moderate ice conditions.

In 2011 INTECSEA (Delft), supported by WorleyParsons and INTECSEA (Houston), performed the FEED study for the Shtokman floater, which is ultimately designed for the harsh environment of the Barents Sea. It is designed to have minimal resistance in sea ice during both straight drift and reversal drift events, minimizing required station keeping forces. The vessel is able to disconnect, even under high ice loads from sea ice. Furthermore, the vessel is fully winterized, protecting personnel and equipment against the extreme Arctic conditions. Assisted by a dedicated ice management system, this vessel achieves high up-time rates.

Image courtesy of Gazprom Dobycha Shelf



INTECSEA and WorleyParsons Participate in Arctic Oil and Gas North America Conference

by Joe Cocker

INTECSEA and WorleyParsons recently participated in IBC's 3rd Annual Arctic Oil and Gas North America Conference, held in St. John's. Having previously taken place in Houston, the event has become a key strategic forum for the major stakeholders in the upstream oil and gas industries.

Approximately 100 engineering professionals across different industries were in attendance. INTECSEA was well represented at the event, with Mike Paulin, Damien Humby, and Joe Cocker (St. John's), Phil Cooper (Woking), and Pieter Meinen (Houston) in attendance. Mike Paulin gave a presentation on the "Trenching of pipelines for protection in ice environments," and contributed to a spotlight session on the "Opportunities and challenges in the world's Arctic regions."

On the third day, IBC held a seminar on FPSOs for Arctic Operation, where Pieter Meinen spoke on the "Challenges associated with design of turret mooring systems for an FPSO to be located in the Arctic region." The WorleyParsons Arctic Global Subsector was also a sponsor of the event and had a new Arctic-themed booth setup at the exhibit.

In photo (left to right): Joe Cocker, Pieter Meinen, Damien Humby, and Mike Paulin standing in front of the new Arctic-themed booth



Justin Motroni from INTECSEA Perth Awarded CSBP Prize

by Cynthia Calderon

Justin Motroni, a Pipeline Engineer in the Perth office, has been awarded a prize for Honors in Mechanical Engineering from the University of Western Australia. This prize is sponsored by CSBP, and is awarded to the student achieving the highest mark for their technical report and associated practical work in the Final Year Thesis Project Part 1 and Part 2 for the Mechanical Engineering Program.

The award ceremony took place at the University of Western Australia campus in Crawley, Western Australia, on May 28, 2012.

Justin Motroni (far right) with other award recipients pose with David Zacher, CSBP Manufacturing Manager Ammonium Nitrate



INTECSEA Achievements

In Picture: Karl Purchase, Manager Subsea Pipelines for INTECSEA, presents prize to Mr. Aaron Boase



Curtin University Science and Engineering Annual Prize Ceremony

INTECSEA presented a prize at Curtin University's Science and Engineering Faculty Annual Prize-giving Ceremony, which took place at the Elizabeth Jolley Theatre on Curtin University grounds in Perth, Friday, April 13, 2012.

The INTECSEA prize was given to the "Best Project in Applied Theoretical Mechanics" of

the school of Civil and Mechanical Engineering for the 2011 academic year.

The winner of the INTECSEA prize was Mr. Aaron Boase, a recent graduate with a Bachelor of Mechanical Engineering who has now taken up employment as a Graduate Well Engineer at Woodside Energy in Perth.

The prize was presented to Aaron Boase by Karl Purchase, Manager Subsea Pipelines for INTECSEA.

Dr. Premkumar (Prem) Thodi



St. John's Engineer Recognized for Outstanding Achievement

Congratulations to Dr. Premkumar (Prem) Thodi, a Senior Engineer out of the St. John's office, for recently being awarded the David Dunsiger Award for Excellence from the Memorial University School of Graduate Studies. This award recognizes Excellence in Graduate Studies in the Faculty of Engineering and Applied

Science, and commemorates the contribution of Dr. A. David Dunsiger, a member of the Faculty of Engineering and Applied Science from 1974-79. Recipients are selected by the Faculty of Engineering Scholarship Advisory Committee, on the advice of the Dean of Engineering and Applied Science and the Dean of Graduate Studies. Congratulations and great job to Prem for this outstanding achievement!

Team INTECSEA: Peter Brownlie, Iain McGibbon, and Jason Gibson



Nissan Corporate Triathlon

With a predicted midday temperature of 41°C (105°F), it was never going to be a stroll in the park—but INTECSEA Perth's intrepid triathlon team proved they were more than up to the challenge of the recent Nissan Corporate Triathlon. Langley Park in Perth is one of the best venues in which to hold a corporate triathlon in Australia and with perfect weather conditions in the morning, the event was set for great success. However, the weather was too good and race distances had to be dramatically reduced to ensure that all competitors were finished prior to the midday sun. While Perth saw its second heat wave in March with temperatures hitting the high 30's °C (80's °F), an earlier start to the event meant that all competitors were off the course by 10:30am, thereby avoiding the increased probability of heat stroke. The INTECSEA team was truly devastated

at this news as hours had gone into a training strategy based on huge endurance.

There was a great atmosphere at the start of the event, as the swimmers set off into the Swan River. The 350m swim leg was followed by an 8 km cycle ride which in turn was followed by a 2.5 km run. The team of dedicated individuals Jason Gibson, Peter Brownlie and Iain McGibbon set to challenge the sporting goliaths in the sad knowledge that they would be unable to rely on their superior endurance. As a result of their valiant efforts, INTECSEA finished the event in 84th place from some 600 teams, a very acceptable first attempt.

The team would like to thank those from the office who made up the "Cheer Squad" and to say they are already in training for next year's event.

"This is a very positive step in optimizing the Houston operation, and steering INTECSEA on the right path for future growth and success."

- Carl Routh

Inside INTECSEA

Houston Leadership Team Hosts Discipline Manager Workshop

by Ron Ledbetter

The Houston leadership team hosted a workshop in February for all Discipline Managers from the floating systems, marine pipelines and subsea systems groups. The workshop, held at the Steamboat Steakhouse in Houston, was meant to further discuss and clarify the roles and responsibilities of INTECSEA Discipline Managers in the Houston operations. Topics such as enhancing communication throughout the organization, streamlining recruiting efforts, assisting with business and people development, and improving engineering and overall business management were openly discussed at the meeting, which is now scheduled to occur on a biannual basis.

Martin Morrison and I facilitated the workshop and Terri Matias coordinated the facilities, invitations and accommodation. Workshop attendees heard remarks from Brian McShane, and were given the opportunity to ask questions about the organization and how the Discipline Managers' role fits in with the overall strategic plan of INTECSEA. This workshop marked a

milestone for INTECSEA, as it was the first time that all of the Houston Discipline Managers had been together since the merging of INTEC and SEA Engineering in 2008.

Overall, the Discipline Managers offered great feedback from the workshop. Carl Routh found the meeting very beneficial, commenting that "This is a very positive step in optimizing the Houston Operation, and steering INTECSEA on the right path for future growth and success." Randy Seehausen, Subsea Systems Discipline Manager for the Houston operations, also found the workshop productive saying that "it was very helpful for the entire group to get together to define roles and responsibilities in great detail, and openly express opinions on the current state of our operation. I look forward to taking some ideas back to my team, and seeing the changes that come out of the meeting. Overall, I felt that the leadership team really listened to our suggestions and that the workshop was a huge step in the right direction."

Holding this meeting helps work towards the goal of optimizing the Houston operations and increasing the level of knowledge and communication throughout our organization.

INTECSEA Houston Discipline Managers gather at the Steamboat Steakhouse in Houston, Texas for their biannual workshop.



Kuala Lumpur Office Holds Team Building Event for Employees and Families

by Hazreena Hamzah

The INTECSEA Kuala Lumpur office recently organized a two-day team building event and weekend retreat at the French Village themed resort, Colmar Tropicale in Pahang, Malaysia. This is part of continued efforts from INTECSEA's management team to enhance teamwork among staff and also to thank employees, together with their family members, for their effort and support throughout one of the busiest financial years for the KL office.

The event was officiated by Senior VP of INTECSEA Asia and Middle East region, Steve Lee and INTECSEA Kuala Lumpur Operations Director, Suhaimi Ismail. In the opening speech Steve acknowledged the hard work that all employees have put in, and also revealed hopes

that next year will be even more thriving and successful for everyone. Following that, team building activities exclusively for staff were carried out, which aimed to foster teamwork and encourage open communications, as well as bridge the gap between managers and staff.

Evening activities with family members included dinner, a lucky draw and the highlight of the night, INTECSEA Idol! Congratulations to Drafting Manager, Thavamoney, who walked away with the 42" Plasma TV. The night ended with the trust walk session, where participants were blind folded and guided by a nominated leader through a roped course to the finish line.

On the final day, a telematch involving all family members (including children) was organized, which gave coworkers the chance to get to know each other outside of the working environment and to create stronger family bonds.

INTECSEA KL employees work together in the leaking pipeline repair teambuilding event





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