QUARTERLY JOURNAL Q4-2008

INTECSEA
WorleyParsons Group

NEPTUNE LNG LLC – OFFSHORE GLOUCESTER, MASSACHUSETTS, USA

Neptune LNG LLC, a subsidiary of GDF SUEZ Energy North America, was granted a permit by the U.S. Maritime Administration in March 2007 to build, own, and operate the Neptune Deepwater Port approximately 8 miles off the coast of Gloucester, Massachusetts. The port facilities will consist of two offloading buoys where specialized LNG carriers will moor and discharge re-vaporized LNG. The natural gas will be transported by way of a newly constructed subsea pipeline to the existing Algonquin HubLineSM system, which will deliver the natural gas to customers onshore. The port will provide a substantial new supply of natural gas to the New England region. Figure 1 presents a schematic of the port facilities.
INTECSEA was contracted in late 2004 to assist Neptune LNG in developing the design of the port and the preparation of the deepwater port permit application. INTECSEA was responsible for the field layout and subsea pipeline system design, including the transition manifold and tie-in to the Algonquin HubLineSM. Offloading buoys, risers, and riser base manifolds were designed and will be supplied by Advanced Production and Loading ASA (APL), the Norwegian company that provides the technology for the Submerged Turret off-Loading buoys (STL).

Figure 1

After being granted permit approval to proceed, Neptune LNG immediately began the execution phase of its deepwater port development. The project execution phase includes finalizing design details; procuring all hardware and components; issuing fabrication and installation contracts; and executing a construction program to complete the offshore installation commissioning and system start-up. The execution programs are expected to last 30 months - from March 2007 to October 2009.

Neptune LNG LLC has engaged INTECSEA for the project management and detail design/engineering of the 13 miles of 24 inch pipeline, tie-in spools, transition manifold and 30 inch x 20 inch hot tap. Project execution for the 2008 phase includes procurement of 24 foot pipe, pipeline installation, trenching, backfilling, flooding, and hydrotesting. Due to schedule constraints the project purchased existing 24 inch OD, 0.5 inch WT, API X 65, 2.25 inch thick concrete coated line pipe. INTECSEA was involved in the assessment of the existing coated pipe including technical and project management of the extensive pipe testing. Offshore installation work started in mid-July 2008. The offshore installation contractor, Cal Dive International (CDI) successfully installed, trenched, backfilled and hydrotested the pipeline between June and October 2008. CDI used the "Lonestar", "American Constitution", "Northern Canyon", and "Atlantic" for the 2008 offshore installation program. INTECSEA personnel were also involved in offshore survey supervision and onshore support in Gloucester, MA, USA.

INTECSEA's detail engineering scope includes pipeline routing, suitability assessment of existing pipe, pipeline stability, pipeline expansion, tie-in spool design, transition manifold design, engineering review and project management of the hot tap procurement package, technical support for the Company supplied valves, misalignment flanges, preparation of specifications for the pipeline related procurement packages and fabrication packages, and review and approval of installation contractors engineering analyses and procedures.

Major Challenges Faced by the Project Include the Following:

- Assistance to Neptune LNG LLC for the permit approval from Regulatory Authorities and Environment agencies
- Suitability of existing 24 inch OD, 0.5 inch WT, 2.25 inch thick concrete coated line pipe
- 30 inch x 20 inch hot tap procurement
- Procurement of Company "free issued" valves
- Adverse weather during offshore installation
- Selection of suitable spool/transition manifold fabrication contractor
- Design of overtrawlable manifold structure (see Figure 2 on page 5)
- Subsea pipeline CP monitoring requirement
- Pipeline routing through STL buoy mooring lines
- Drying requirement and commissioning the system with gas from the 30 inch Algonquine Hubline SM without flaring or venting the Nitrogen

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Email Ed-iquette *by Ed Smith*

I want to write about e-mail. I know I'm supposed to think (and act) on issues much more strategic than e-mail, but given the accelerating trend toward more electrons and less paper (and postage) we need to make sure we're not misusing this tremendous communication asset. Nowadays we spend a lot of effort and resources on corporate image, reputation and relationships but at the same time, we are seeing more and more of our interpersonal interaction, the stuff that long lasting relationships are made of, being under exercised as we rely more and more on e-mail with its array of etiquette land mines capable of eroding the relationships, trust and reputations already in place.

What makes me a sufficient enough expert to opine on e-mail? First of all, it's because I've probably violated every e-mail etiquette rule you've ever seen and experienced the ramifications. Secondly, I'm connected! I have a Blackberry Bold, an iPhone, a HTC Smartphone, multiple desktop and laptop computers and even a set of Styrofoam cups connected with a string in case the batteries in all the other gadgets end up being drained. I am MR. CONNECTED.

But, you know, garbage-in still produces garbage-out no matter how many gadgets you have and how loaded they are with the latest applications. The e-mail addiction controlling my life (it has me sneaking off to dimly lit places to check to see if anyone still needs me – must be a security issue) is particularly wasteful when e-mail is at its most inefficient level. But it's not e-mail that's inefficient, it's the authors…including me. E-mail is great and allows us to work across time zones, multi-task, address multitudes of people at the same time…but it also has its downsides. For example, the temptation to abbreviate messages and the loss of the non-verbal component of the communication often results in messages that are unclear, misleading and probably not worth the electrons they consumed. We need to clean up our acts. The internet has a host of sites offering suggestions on e-mail etiquette. I've stripped a few of them and reproduced them in the sidebar. All are good suggestions.

Let me add a few more:

1) Use the virtual Breathalyzer Delay Function (BDF). If you write an e-mail after having a few pints of Guinness or more than your share of a bottle of wine, have the BDF embargo your critical (and probably what you view as a literary masterpiece) note until the affects of the alcohol are gone and you've taken the time to re-read the note. You'll probably decide to do considerable editing including the possibility of totally trashing the note.

2) Don't use words of more than three syllables. First, they are hard to spell and you (and your reader) won't necessarily agree on the meaning so misinterpretations are likely…and disastrous. So stick with easy words…like Duh.

3) Assume everything you write will be forwarded to the place where it will cause the most embarrassment to you (like the soon-to-be-posted YouTube video of me doing the Wii Fit Hula Hoop routine). E-mails are not private and someone in the chain is bound to forward the whole chain to a bunch of people or mistakenly hit the "reply to all" and then you're dead meat. Just like the evil things you were caught doing back in grade school…e-mail becomes part of the "PERMANENT RECORD"! Remember: Fast Flying Fingers Foul Future Fortunes.

4) Please get your grammar right. There are lots of engineers out there who don't know "hear" from" here", "their" from "there", "too" from "to" or "two", so pay attention to grammar otherwise your worldwide ranking in the succession pool or high-potentials roster may suffer dramatically.

5) Don't forget we are an international community now with messages being written and read by many non-native English speakers. Have sympathy and minimize the use of local slang or idioms. Be sensitive to shifting definitions as you cross borders…like the Australian girl running around London in her thongs. Remember the internet is a global community, and other people's values and outlook on life may be different from your own. Be tolerant and careful with slang or phrases that may be misunderstood in another country.

The best thing about e-mail gadgets is that they come with two very important keys…delete and power-off. We need to know when to use those keys and use the more traditional telephone and face-to-face communication. They may not have the same degree of efficiency but the interpersonal value is immeasurable. Let's get the right balance in our communications portfolio.

As for my styrofoam cups, that's what scissors are for.

INTECSEA Melbourne Completes Design for Conversion of Deck Barge to World's First Twin-Firing Line Laybarge *by Colin Paton, Senior Naval Architect*

The Water Delivery Alliance (WDA) comprises WorleyParsons, Bovis Lend Lease, KBR, McConnell Dowell and ERM. The Alliance was awarded the installation and commissioning of a pipeline and pump facility to transport drinking water from the Sydney Desalination plant into Sydney's water grid. This comprises a roughly 17km long pipeline under densely populated areas in Australia's largest city, one of Australia's busiest container ports, the flight path for Australia's busiest airport and along the second most polluted river in the southern hemisphere. Approximately 7km of this pipeline travels across Botany Bay. In order to comply with strict environmental and community requirements, it was decided to lay twin 57 inch concrete coated pipes in a train with two dredgers and two discharge barges to cross Botany Bay.

As the project was unable to acquire a pipelay barge capable of laying twin 56 inch pipe in shallow water, it was decided that the Alliance would design and build the laybarge. WDA employed INTECSEA Melbourne to be the lead designer for the pipelay barge in late February. The laybarge design has progressed against a very tight schedule with the concept for the laybarge frozen in early April while the first steel was cut at the yard, Kenchana HL (KHL) near Lumut in Malaysia, in late June. This fast track schedule has highlighted some of the challenges faced by the design team due to the competing interests of cost, schedule and safety.

The work undertaken by INTECSEA included pipelay operations, stability, towing, mooring, logistics and supply, uptime analysis as well as structural design of the elevated decks, equipment foundations, stern recess, stinger and A-frame connections. Also within INTECSEA's scope was design supervision and coordination between the many offices of the Alliance members assisting in the project.

Structural work in the yard continued into early October with mechanical and electrical construction to follow along with a very challenging six week commissioning schedule. The barge was sailed, under tow, from the yard in early December. Following the roughly 27 day tow, a further two weeks of commissioning has been allowed in Sydney prior to the first lay which is expected in early February 2009.

The size of the pipe and the design service life of 100 years has resulted in a welding procedure which is expected to take roughly two hours per joint, along with restricted hours of operation (due to proximity of residential housing). It is expected that the pipelay will be completed in late May or early June, 2009. Following completion of the pipelay, a bifurcation from the single 72 inch land pipeline to the twin lay 56 inch pipeline needs to be completed.

In addition to INTECSEA's involvement, WorleyParsons has conducted design and analysis of the metocean, dredging and community aspects through WorleyParsons Sydney (personnel formerly from Patterson Britton and Partners).

Michael Wright is the contact for the dredging, metocean and community work conducted by WorleyParsons while Colin Paton is the contact for the design within INTECSEA. (michael.a.wright@worleyparsons.com or colin.paton@intecsea.com)

The Virtual Control Buoy *by Kevin Mullen*

The birth of a new idea: I've been in this industry for 17 years, and this is the first new thing I've seen in subsea controls in all that time. Yes, we've seen all-electric systems appear, and fibre optic systems appear, but people were talking about all-electric and fibre optics even 17 years ago. This is something completely new.

The concept of the Virtual Control Buoy (VCB) was launched with a presentation at DOT Asia Pacific 2008, which was held in Perth, Western Australia, in December 2008. Receiving the award for Best Presenter at this subsea conference was the highlight of my career, and gave recognition to the innovative nature of this concept.

But the idea came to me three or four years before, as a result of flicking through the magazines in the INTEC Perth kitchen. The concept was refined when the idea was rolled out to the INTEC Perth Subsea Team 12 months ago, and their valuable comments and criticisms were taken on board.

To set the scene, Western Australia is blessed with a number of very large gas fields. Unfortunately, they are all subsea and all remote from land. To control them, you need either long distance umbilicals, control buoys, platforms or floating facilities – all of which have disadvantages.

As an alternative, I proposed something called the Virtual Control Buoy to provide a means of communicating from the onshore control facility to the subsea wells.

This concept may be used in the future for the control of remote wells. The VCB eliminates umbilicals, is fault tolerant and robust, is cheaper than control buoys, and works at any stepout.

The Seaglider Solution
The VCB concept uses a type of Autonomous Underwater Vehicle (AUV) called the seaglider, as a means of communicating from the onshore control facility to the subsea wells.

A fleet of two or three seagliders drifts above each subsea wellhead communicating with the wellhead by acoustics and with the onshore control facility by Low Earth Orbit (LEO) satellite.

Each seaglider uses GPS to track and maintain its position.

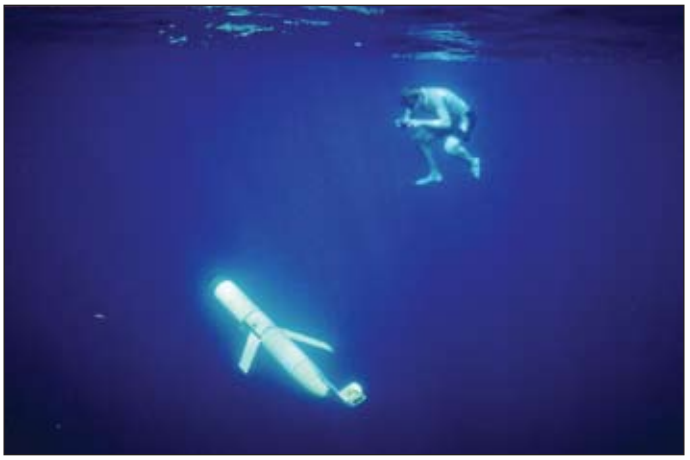
Communications and Control
Satellite and acoustic communications are already proven with seagliders. In 2003, Slocum seagliders equipped with acoustic modems acted as communication gateways for sensor nodes on the seabed. Acoustic control of a subsea well was demonstrated from the Agip Luna A platform in 1987.

The Iridium satellite network is used successfully by many metocean seagliders.

How the Seaglider Moves
The seaglider drives itself through the water not with propellors, but by changing buoyancy and using wings to produce forward motion. The very slow speed and efficiency permit long-duration operations. In this respect, it is copying nature. Many marine mammals, including seals, dolphins and whales, use gliding to conserve energy.

Autonomous Operation
The following aspects of the VCB do not need human intervention:

- Autonomous position keeping (virtual mooring) by the seaglider;
- Autonomous fail-safe shutdown of the subsea wellhead after losing communications to the onshore facility; and
- Cooperative seaglider behavior, ensuring that seagliders are spaced out over the wellhead, and do not all dive together.



Seaglider Operations
Locating up to three seagliders above each wellhead provides a high level of redundancy. Seagliders can be reassigned from one wellhead to another to meet operational requirements. Each seaglider uses GPS to track its position. If it drifts outside its watch circle, it autonomously submerges, glides underwater and re-emerges on location. In this mode of operation, which has come to be known as the "virtual mooring", a glider can hold station as well as the surface buoy of a mooring.

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DOT Conference & Exhibition, Perth, Western Australia

The 20th Deep Offshore (DOT) Technology International Conference & Exhibition held in Perth, Australia, December 3-5, 2008 attracted 1,596 visitors and conference delegates from 30 different countries. Exhibitors and conference delegates alike praised the high quality of the event in terms of program content, technology exchange, attendees, delegates, exhibits and networking opportunities.

101 companies were represented at the exhibition. 394 delegates attended the conference proceedings, which INTECSEA sponsored with promotional CDs available from our Exhibition Booth. A total of 1,158 visitors attended the Exhibition over the course of the 3 days.

Technical Conference

As it has in past years, the DOT technical program served as the major highlight of the conference. INTECSEA was well represented at the Conference with papers and subsequent presentations. Well done and a big thank you to all of the authors for their contributions and efforts. Papers and presentations included:

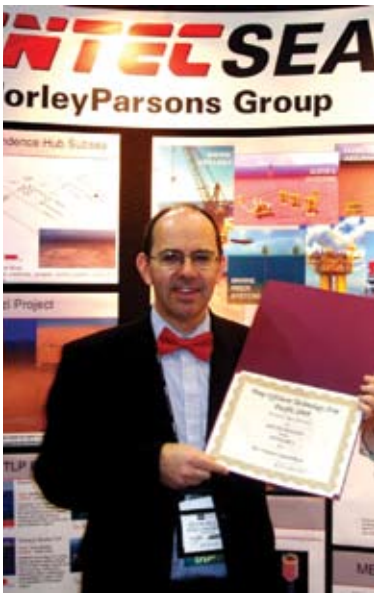
The Development of Floating Control Facilities for Remote, Deepwater Fields
Authors: Peter Brownlie & Dr. Jinzhu Xia (INTECSEA, Perth)

New Semi-submersible Design for Ultra-Deepwater Dry Tree Applications
Author: Dr. Alaa Mansour (INTECSEA, Houston)

Subsea HIPPS Design Methodology
Author: Kevin Mullen (INTECSEA, Perth)

The Virtual Control Buoy
Author: Kevin Mullen (INTECSEA, Perth)

Response Based Design Metocean Conditions for a Permanently Moored Vessel in Cyclone-Affected Area
Authors: Yuriy Drobyshevski & James Whelan (INTECSEA, Perth)



We are proud to announce that Kevin Mullen, won the **DOT 2008 Best Presenter Award** for his Virtual Control Buoy Presentation. Congratulations, Kevin on an outstanding achievement!

The conference included a lunch webcast. Our very own Tom Choate, INTECSEA Houston, was one of five expert speakers on the subject of "**Dangers of the Deep**."

INTECSEA Technical Seminar

During the DOT Conference, INTECSEA Perth held a Networking and Technical Seminar Evening for clients and staff, which Stephen Rivers hosted, whilst Alastair Walker conducted a presentation on "The Application of Advanced Engineering" and Tom Choate conducted a presentation on "Active Subsea Production Technologies in Today's Ultra Deepwater Developments".

A big thank you to Jim Osborn, Michelle Lang, Cherie Osman, Tom Choate, Alastair Walker and all the Perth staff who were involved in making this event a success. The Perth office now has its sights set on the Australian Oil & Gas Expo in Perth, February 17-19, 2009.

If you would like any information on the Proceedings please contact Bernard Mackin (INTECSEA, Perth). The next DOT International Conference and Exhibition will be held in New Orleans, Louisiana, February 3-5, 2009. DOT International returns to Monaco, November 3-5, 2009 for the first time since 1993. For more information please visit www.deepoffshoretechnology.com

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During 2009 the second phase of the construction program will be implemented with the installation of the STL buoys, hot tap, the subsea structures and the associated tie-in connections, including leak testing, de-watering, drying and commissioning the 24 inch pipeline with gas from Hubline. Once this is complete the Neptune LNG Port facility will be available to receive gas.

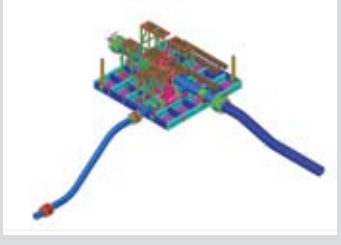

Figure 2: Overtrawlable Structure

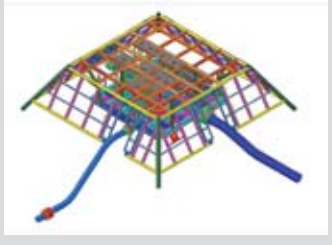

Figure 3: Mudmat/Piping

Response Based Analysis of a Permanently Moored Facility in Cyclone Affected Area *by Y. Drobyshevski, J. R. Whelan*

Acknowledgement: Woodside Energy Limited

INTECSEA in Perth has been approached by oil companies with two challenging problems related to the design of permanently moored FPSO and Floating LNG in Australia:

- Design Metocean Conditions (DMC) in cyclones – to design the facility to be able to withstand the cyclonic environment without the need to disconnect from the mooring system
- Operability predictions – to make sure that in ambient environment availability of the floating facility meets the target

Design Metocean Conditions in cyclones is a challenge. They may be selected as usual by assigning extreme statistics of sea, wind and current (say 100-year return, or 10,000-year return), but such combinations may be too conservative or unreliable. Furthermore, the directionality of possible combinations (relative to each other and to the vessel) is also a question. Hence, when such environmental combinations are applied in the design, they may either point to unrealistic feasibility issues or result in over-designed hull, topside supports, mooring system, etc.

Operability of the facility is affected by the vessel motions, from the points of view of process and ability to offload LNG onto LNG carriers. Operability assessment needs to be made at an early design stage as it affects feasibility, deck layout, requirement for thrusters, etc.

INTECSEA's approach to both challenges is to apply the Response Based Analysis (RBA), the essence of which is to predict and to examine responses (motions, global loads, green water, etc.) of the vessel based on the "raw" environmental records generated by a Metocean Consultant. Such approach avoids intermediate post-processing of metocean conditions and associated uncertainties. Instead it establishes statistics of critical responses. The objective of the RBA is to determine which exact combinations of waves, wind and current are causing extreme values of certain critical responses (for example 100-year return roll angle, bending moment, heave at turret, accelerations, freeboard exceedance, etc.). As a "by-product", the actual extreme N-year return responses are predicted, which can be used for feasibility assessment and design. Another benefit of the method is that the vessel operator gets insight into the realistic behaviour of the vessel in cyclones from visualizing the environment and heading of the FLNG or FPSO when a cyclone passes over.

Methodologies and in-house software developed by INTECSEA predict heading and motions of vessels and their statistical properties and efficiently handle large environmental data sets (x100,000 records). It is possible to use directional (carpet) wave spectra, as opposed to JONSWAP formulation, to avoid parameterization of the spectra where essential information on the wave climate may be lost.

In 2007 INTECSEA was contracted by Woodside to perform an extensive study on the FLNG, FPSO and FSO permanently moored at Sunrise field. Heading and 20 critical responses (including roll, pitch, heave motions, bending moment, sheer forces, green-water, etc.) were predicted for tropical cyclones over periods of 500 years and 100,000 years, to cover cyclonic events from the 100-year to 10,000-year return period. For each cyclone, records of waves, wind, and current at half-hourly intervals were generated from synthesized tropical cyclone databases, developed at Woodside. From these records INTECSEA produced time histories of the heading angle and all critical responses, and established extreme responses for any given return period up to 10,000 years. At the next step, the corresponding environmental combinations causing the extreme responses were determined and compiled into sets of Design Metocean Conditions (DMC).

As an example, the study quantifies that the highest return period sea state only needs to be applied within a limited range of incident angles. Similarly, for the beam-on direction, which governs roll response, the significant wave height should be substantially reduced. For each of the 20 critical responses, specific DMC have been assigned. The analysis was extended to directional (carpet) sea spectrum. The sensitivity of vessel behavior to changes in its properties (wave drift forces, current coefficients and turret location) was also examined.

The Sunrise study has been undertaken in several phases, and while the final phase is still on-going, Woodside has awarded INTECSEA another study to produce the DMC and to examine feasibility of similar facilities for Browse development.

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Seagliders are small and light enough to be handled by two men and can readily be launched from small vessels close to shore where the sea state is more benign than out in the open ocean. The seaglider sails out to the field and returns at the end of the mission for retrieval and maintenance.

Mission Duration

Thermal gliders generate their own power using the temperature differential encountered during each dive. This is an enabling technology for long mission durations. At the University of Western Australia, Akash Patel is researching the power/energy/duration issues for me right now, as part of his Master's thesis. Seagliders are a hot research topic for the academic community, so we can get the development work performed free of charge!

The vision is for mission durations of 6-12 months so the work involved in maintaining the seaglider fleet is not excessive.

Self-Powered Wellheads

As the umbilical is eliminated, the wellheads would be self-powered. Generation of electrical power is needed to operate the control and communication systems at the wellhead and also operate pumps to generate hydraulic power for the operation of valves in the subsea xmas tree and downhole.

Numerous methods were developed and applied in the 80s and 90s for subsea power generation and subsea hydraulic units. The VCB concept will resurrect interest in these systems.

Reasons for Not Using the VCB

Seagliders may not work well in busy shipping lanes. They have also been known to be "salvaged" by passing vessels. I've heard of one that was being tracked and its velocity suddenly went from half a meter per second to about 12 knots towards shore. Not only that but it actually traveled further inland. The owners eventually located the seaglider in a fisherman's garage!

The seaglider may also struggle in areas with high currents, in ice or in water which is too shallow for diving.

None of these problems apply off the North West Shelf of Australia. It's a dream location for the VCB - deep water, remote and with very little infrastructure. The area does suffer from occasional cyclones, which will not damage the seagliders (they have been known to survive typhoons) but will cause a loss of communications, necessitating a shutdown of the subsea wells.

Chemical injection, annulus venting and hydrate remediation can not be carried out by seagliders but they can be solved by other lower-cost means, such as strapping coiled tubing on top of flowlines, instead of using lines within an umbilical.

Feasibility

All the technologies are proven, the only novel aspect is using them all together and for control of subsea wellheads. This concept could be an enabling technology for the long stepouts of the large gas developments off the North West Shelf of Australia, as it can dramatically reduce the cost of subsea control.

Other embodiments of the VCB could use any autonomous vehicle such as the floating autonomous vehicle that my research student at UWA found. The VCB concept is released - free of patents - for the subsea community to use.

INTECSEA Perth Enters Taekwondo Championship *by Bernard Mackin*

INTECSEA's Graeme Atkinson entered the Australian National Taekwondo Championships in Melbourne, December 6-7, 2008. At the age of 50, Graeme entered the Black Belt Veteran events (for competitors over 40 years old). Graeme picked up a gold medal for the 'Patterns', making him the Australian Champion for this event. He also won a bronze medal for 'Sparring'. Graeme says, "I had a slight black eye and sore muscles for a couple of days after the event but it was worth it. It was a real challenge. Most of the Veterans are Taekwondo Instructors and have their own schools, so I knew that beating these guys wasn't going to be an easy task".

Taekwondo, Karate and other similar Martial Arts are the best sports for building total fitness and working all the muscle groups in the body while improving strength, stamina, suppleness, agility and speed. Taekwondo is much more than that – it is a way of life.

Graeme is actively encouraging more veterans to join the sport and gain super overall fitness levels. In February 2009, Graeme is launching his Martial Arts website www.turbios.com, specifically aimed at Veterans. For the future, Graeme intends to break as many barriers and age preconceptions as possible and practice Taekwondo until he is over 100.

Presentation of Paper on "Risk Based Approach for Pipeline Protection Design *by Dr. Wang Leqin, Dr. Wei Jianwu, Dr. Chen Qiang and Mr. Chia Hong Kiat*

The 4th Asian Pipeline Conference and Exhibition organized by ASEAN Council of Petroleum Gas Centre (AGC) and the Malaysia Gas Association (MGA) was held November 19-20, 2008 in Kuala Lumpur, Malaysia. Dr. Wang Leqin of INTECSEA, Singapore, was invited to present a joint paper, written together with her fellow colleagues, Dr. Wei Jianwu, Dr. Chen Qiang and Mr. Chia Hong Kiat on the topic entitled "A Risk Based Approach for Pipeline Protection Design".

Submarine pipelines within harbor areas and shipping lanes are exposed to potential anchor drag or dropped objects. Typically these pipelines are buried and protected with rock armor protection berms. The design of these protection rock berms has been traditionally based on model testing because there is no analytical solution available to resolve the complex interaction between the anchor, anchor chain, seabed and rock armor which usually makes such design conservative. The paper presents an alternative risk based design approach with the aim of design optimization in line with submarine pipeline design code such as DNV-OS-F101. A 3-D non-linear Finite Element (FE) analysis was employed to study the risk of anchor damage to pipelines protected by rock berm.

IOPF 2008

This year October marked the 3rd Annual ASME International Offshore Pipeline Forum (IOPF) and Exhibition in Houston, Texas, USA. Building on the theme of the Forum "Piping Knowledge to the New Era", conference sessions were hosted on several topics, including Flowlines, Risers, Export Pipelines, Operations and Integrity/Maintenance/Repair, with a special session on design codes and guidelines - "API/ISO What's in the pipeline?"

INTECSEA actively participated in the Forum via both the steering committee and conference sessions. This year Amitabh Kumar presented a paper on "Hurricane Induced Pipeline Displacement and Remediation Options in Areas with Seabed Instability". The paper presented a summary of how a project assessed the integrity of a pipeline system that was displaced significantly during a hurricane, determined its long term condition and developed an optimal remediation solution. We would like to take this opportunity to thank the authors - Amitabh Kumar, Neil Summer and Brian McShane for their contributions to the Forum.

As a preamble to IOPF, INTECSEA in association with ASME-IPTI, hosted a one day "Subsea Pipeline Design Overview" course. The eight module course was presented to an audience of over 30 delegates and covered topics on Design Basis, Flow Assurance, Routing, Pipeline Mechanical Design, Materials and Construction. Our heartfelt thanks go to the presenters – Dr. Scott Bufton, Marc Bik, Amitabh Kumar, Dr. Paul Laws, Jerry Hoose and Brian McShane. In addition, we would like to thank Melanie Diaz from ASME-IPTI who coordinated and facilitated the event. The course was well received and proved to be a very interactive program between the presenters and delegates. To quote a couple of attendees...:

"All instructors had excellent knowledge and effective presentation skills and the overhead slides were fantastic."

"The material was very good and interesting."