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INTECSEA
WorleyParsons Group

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HESS TUBULAR BELLS ARE RINGING

by Jeff Whipple

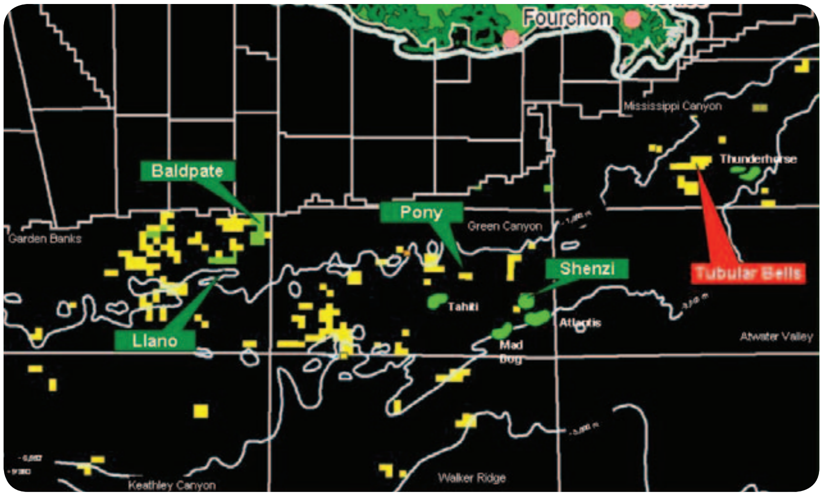
Tubular Bells is a deepwater discovery located 148 miles southeast of New Orleans, 4,500 ft under water in the Mississippi Canyon region of the Gulf of Mexico. The field, discovered in the Lauri Basin in 2003, is a deep Miocene discovery that is long and elliptical in shape and spans portions of Blocks 682, 683, 724, 725, 726 and 727. Tubular Bells is considered to have recoverable resources bound by oil-in-place and compartmentalization uncertainty.

INTECSEA is committed to providing client satisfaction and technical excellence in developing green field projects, and has provided engineering and project management support during the early Concept, Appraise, Select, and Define project development stages while BP held operatorship. The INTECSEA scope of work covered Subsea, Umbilicals, Risers, and Flowlines (SURF) and the Export Pipeline systems. The Select and Define stages of the project were performed in our Houston ECII office on North Dairy Ashford Road.

During the Select phase, INTECSEA working with BP narrowed the field architecture choices from eleven options involving regional host, local host, and stand alone tie-ins down to a single option for Define. Following a robust selection process, SBM Atlantia was selected to provide a deep draft semi-submersible as the host and to act as the third party responsible for engineering design, installation and operation of the Tubular Bells facility.

Prior to November 2010, ownership of the field was split among BP 50%, Chevron 30% and HESS 20%. On November 5, 2010, BP officially transferred 20% ownership to HESS, allowing HESS operatorship of the field. As BP personnel left the project, a new HESS/INTECSEA integrated team, located at our Houston ECII office was formed to execute a new Refine stage for the project.

Early in the Refine stage, the host selection was reconsidered by the partners. This resulted in the selection of the Williams Partners floating production system, Gulfstar GS1, as the new host for the Tubular Bells field. Gulfstar GS1 will be designed so that it can serve as a central host for other operations in the same deepwater area.



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Experience is Learned
by Uri Nooteboom

Experience, according to the dictionary, can be defined as "knowledge acquired through the senses and not through abstract reasoning." In other words, experience requires physical interaction, which generally accumulates over time; it is not an intellectual attribute and is not the same as talent.

Another way to define experience is by measure of the sum total of the lessons from our past. In early childhood, most of these learnings were firsthand and often through negative reinforcement, either intentional, as in punishment for bad behavior; or unintentional (I'll never put a nail in an electric socket again!). Experience from those early years is not truly realized until we are older. By then we also realize that not all lessons have to be learned firsthand and other people's lessons are just as valuable. In either case unfortunately, negative lessons and experiences are often far more memorable and can be far more effective in shaping our future actions than the positive experiences.

Negative outcomes can be analyzed and root causes can be identified, while the positive experiences are more complex and nuanced and don't lend themselves well for analysis. It is easier to define what made Goldilocks' porridge "just right" by what it wasn't: not too hot and not too cold.

Similarly, professional experience is gained by direct involvement in, or awareness of past projects. Successes are far less likely to shape our experience than negative events involving errors, failures, accidents, etc. To be able to repeat a success one must understand why it turned out positive in the first place. Knowledge of such successful events is irrelevant unless we know what problems were solved and what potential missteps and errors were avoided to achieve the successful outcome. You cannot achieve success unless you know how to prevent failure.

Although in theory the collective industry learnings database is substantial and should cover just about every possible lesson that could be learned from our previous endeavors, in practice our projects to a large extent rely on the personal experiences of the individuals engaged on the project. Despite our myriad attempts at lessons learned databases and processes, the useful experiences and associated learning for the future will rarely be communicated in any written database. Often these lessons are sheltered behind the façade of the "we did everything right" mantra, they are not suitable for "public" knowledge or are otherwise politically undesirable. Most often however, project priorities simply prevent these lessons from being recorded in real time and by the time projects wind down, memories are no longer fresh and the project team has checked out.

Experience is like the pixels on a grid. From afar these pixels paint a coarse picture, but up close (at the project level) there is a tremendous amount of uncovered white space and the picture dissolves into seemingly random dots. That is where talent comes into play. Talent provides the "smarts" and the "intuition" that help to distinguish the big picture, in order to fill in the white space and enhance the resolution at the project level to picture quality. However, no amount of talent will be able to expose a meaningful picture without a good many experience pixels sprinkled in the right places.

The key to success is finding a way to embed the learning culture into the hearts and minds of the organization, in much the same way we have been successful with embedding the safety culture in our industry. Unless we establish effective inter-company and extra-company communication and the tools to share them across projects, regions, operations, business units, cultures, companies and other industry silos, we are wasting our collective experience.

In which case, failures will always remain predictable in hindsight. We could have known, and we did.

Hess Tubular Bells are Ringing
continued from pg. 1

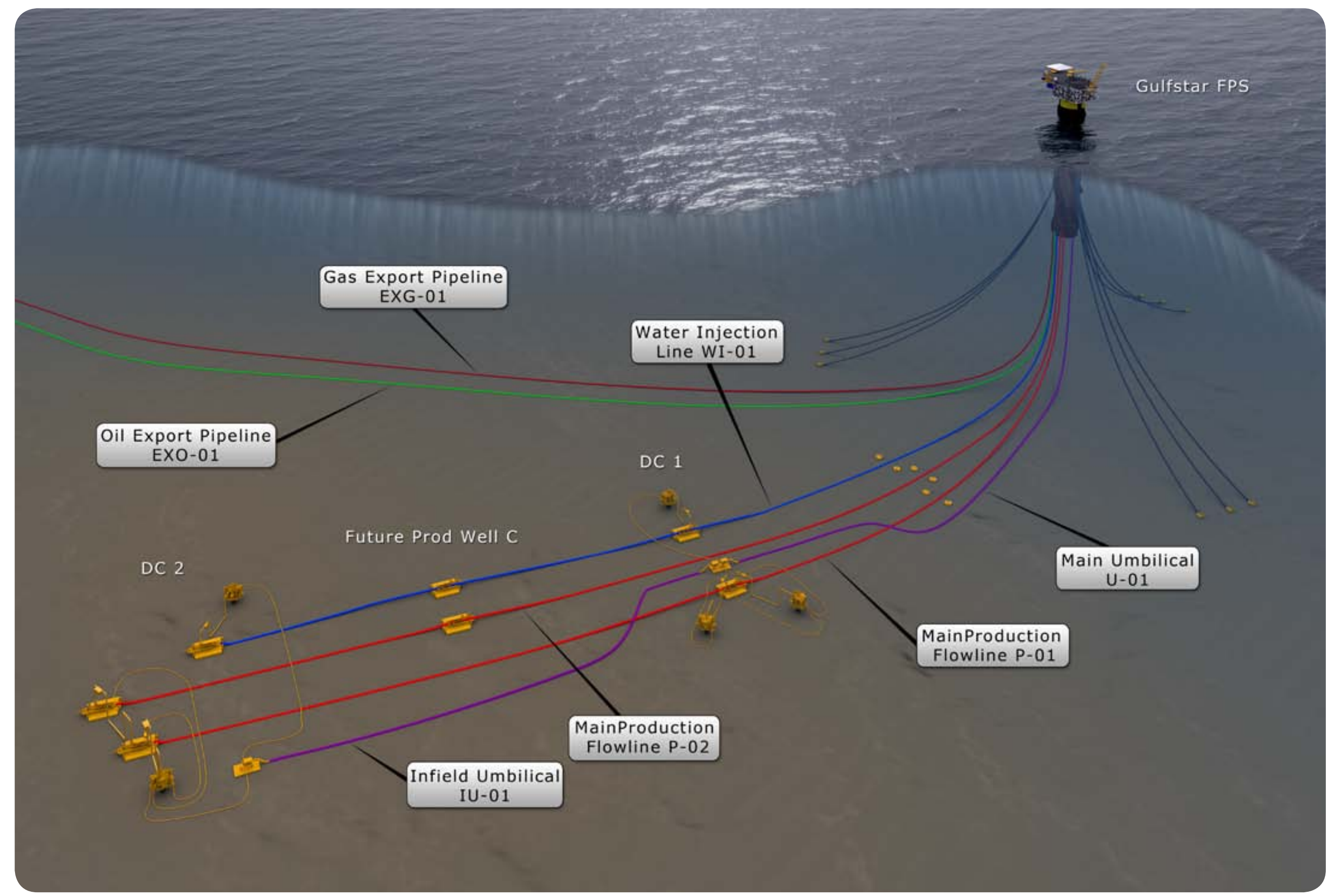
Williams Partners will design, construct and install its Gulfstar GS1 with a capacity of 60,000 bopd of oil, up to 200 MMcf/d of natural gas, and the capability to provide seawater injection services. The facility will be a spar-based floating production system (FPS) utilizing a traditional three-level topsides mated to a classic SPAR hull.

In June 2011 the ownership of the Export Pipeline systems was transferred to Williams Partners. A separate, independent INTECSEA team operating from our Houston Corporate office on John F. Kennedy Boulevard was developed to perform the Export Pipelines engineering for Williams Partners.

HESS sanctioned the SURF project in June 2011. The integrated project team is currently waiting on the remaining partners to complete their sanction process, which is expected to complete by September 2011. The team is progressing with the placement of purchase orders for key long lead equipment and pipe.

The field consists of two drill centers (DC-1 and DC-2) linked by two 8-inch production flowlines (P-01 and P-02) connected to form a piggable loop. The two production flowlines use Steel Catenary Risers (SCRs) having Titanium Stress Joints (TSJs) connecting to the FPS porch on the SPAR hull. DC-1 will initially be setup for two production wells and one water injection well, all of which will use 15K subsea vertical trees. DC-2 will have one production and one water injection. Both drill centers will be serviced by an umbilical and controls distribution system that allows for future expansion. The field development will include in-line sleds (ILS) that will also allow for future field expansion.

INTECSEA is equipped to meet the challenges and opportunities in developing this high pressure (15K) and high temperature (300°F) field development in the Gulf of Mexico. INTECSEA also looks forward to a long and successful relationship to meet first oil objectives on this project, and assisting HESS on other future projects around the world.



Chevron Blind Faith Subsea Gas Lift System

by Spiridon Ionescu

INTECSEA is continuing the support of Chevron Blind Faith subsea development in the Gulf of Mexico.

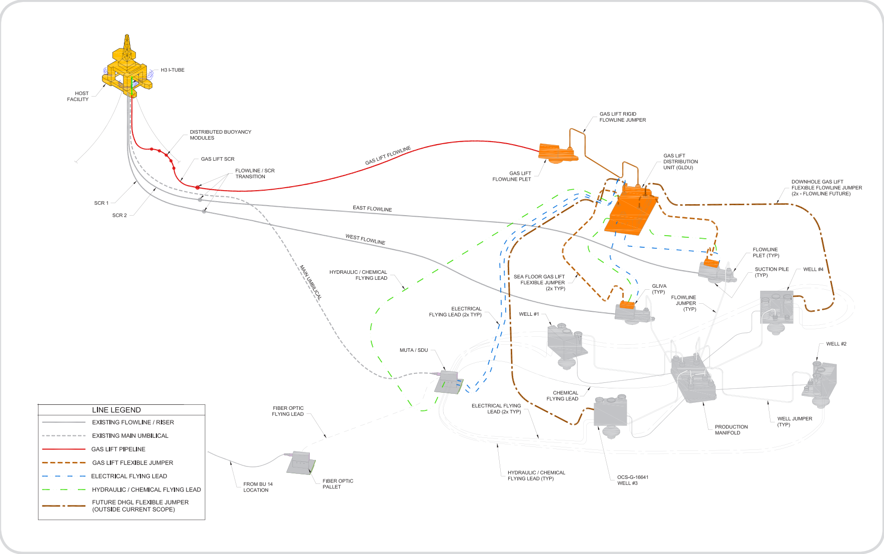
Chevron Blind Faith subsea development was brought on line on November 11, 2008 when the first subsea tree was opened delivering oil to the Chevron new build, deep-draft semi-submersible and dedicated local host located in the Gulf of Mexico.

INTECSEA was involved with this successful development from Pre-FEED start, in 2004, to subsea installation and pre-commissioning, working closely with the Chevron Subsea Team to develop the production system.

In 2010 Chevron assessed viable options for artificial lift suitable for Blind Faith, and seafloor gas lift was selected for enhancing production and oil recovery from the existing subsea field.

Continuing the working tradition between Chevron and INTECSEA related to the Blind Faith development, INTECSEA was contracted to provide engineering during Pre-FEED and FEED for the new subsea gas lift system.

The existing Blind Faith subsea production development consists of four subsea wells located in approximately 7,000 ft of water depth, producing oil gathered into a subsea manifold via rigid jumpers located in the Mississippi Canyon area (Block 695 and 696), approximately 4.6 miles from the host.



Subsea gas lift addition

Produced oil is transported to the existing host, moored in approximately 6,500 ft of water depth through two 7.675-inch OD subsea flowlines and Steel Catenary Risers (SCR). A closed loop piping system is facilitated in the subsea manifold for the dual flowlines and SCRs, to permit round trip pigging and dead oil circulation.

Gas lift will be delivered subsea through a dedicated 4.5-inch O.D. Steel Lazy Wave Catenary Riser (SLWCR) that will be pulled through an existing I-tube at the host. Gas lift will be distributed subsea by a mudmat installed subsea Gas Lift Distribution Unit (GLDU) through a 2-inch ID flexible jumper to the existing production PLET.

The new Subsea Gas Lift Distribution Unit (GLDU) will distribute the gas to two seafloor locations and have the capability to accommodate two downhole locations in the future. The GLDU will accommodate up to four actuated subsea gas lift chokes, one on each of the four gas lift distribution branch lines. Gas lift distribution will be metered subsea by using a Singe Phase Flow Meter (SPFM) in each of the GLDU branches, upstream of the subsea gas lift chokes.

Retrievable flow modules will be used for each of the subsea gas lift distribution branches. The retrievable flow module accommodates a bolted bonnet-type subsea gas lift choke, a single phase flow meter and instrumentation. Two flow modules dedicated to seafloor gas lift will be installed initially, and downhole flow modules will be engineered and installed as necessary in the future.

The subsea gas lift system will be operated using the existing Blind Faith subsea Electro-Hydraulic Multiplexed (E/H MUX) control system via a dedicated Subsea Control Module (SCM) mounted on the GLDU. The Subsea Control System (SCS) on the host facility will also be upgraded to incorporate the new gas lift system monitor and control functionality.

The main technical characteristics of the new subsea gas lift system are as follows:

- Subsea gas lift system rated to 12,500 psi.
- Accommodates up to 18 MMscfd gas lift flowrate and distribute to seafloor and downhole injection locations.
- Seafloor gas lift system operating pressure is 3,100 psi for the seafloor and 7,500 psi for future downhole gas lift.
- Subsea GLDU will be controlled and monitored using two SCMs. One SCM dedicated to Seafloor gas lift functions and overall GLDU operation with future expandability, and a second SCM dedicated to downhole gas lift operation.
- The existing Subsea Distribution Unit (SDU) will provide the power and communication for the GLDU mounted SCMs.
- MeOH that is required for hydrate remediation, start-up, and shutdown operations will be delivered by the existing subsea chemical injection system. The gas lift system will also include access points to facilitate ROV intervention.
- A subsea Gas Lift Isolation Valve Assembly (GLIVA) will be installed on the existing production PLET to provide remote isolation of the subsea production at the gas lift injection point to comply with BOEMRE guidelines.
- Additions, changes and upgrades of existing topsides and subsea operating facilities including all related control systems.

INTECSEA is also providing project management support related to subsea scope of work as:

- Assist Chevron in the Chevron Project Development Execution Process (CPDEP) process.
- Classified by Chevron as a Major Capital project.
- Support the project FEED phase with pipeline design, flow assurance, subsea development and installation documentation.
- Working closely with the Chevron Covington office, Stress Engineering, and DNV for gas lift riser design.
- Providing purchasing and contractor management support, including Request for Quotation (RFQ) preparation, contract negotiation, execution management, delivery, installation and commissioning of subsea equipment.
- The project is being executed within budget and the schedule is working seamlessly as an integrated project team with the client organization.
- Coordinating the subsea gas lift scope of work including riser, pipelines, PLET, rigid jumper, GLDU, retrievable flowmodule, seafloor gas lift chokes, SPFM, GLIVA and flexible jumper.
- Minimize operating facilities downtime during installation and commissioning.
- The Blind Faith Gas lift subsea scope is currently in the FEED stage planning transition to the execution phase. Long lead items such as flexible pipe and assemblies included in the subsea equipment vendor deliverables are currently being evaluated for award.

The project team plans to begin execution in mid-2012, with first gas in mid-2013.

From left to right: Eric Richards, Kalyana Janardhanan, David McLaurin, Luciana Aviz, Jenny Velazquez, Ronnie Zerpa and Spiridon Ionescu.

The INTECSEA project team is committed to support Chevron to ensure the successful execution and implementation of the gas lift system.

INTECSEA Family Fun Day 2011
by Suhaimi Ismail

On July 23, 2011, INTECSEA KL held a family day at Jungle Lodge Alang Sendayu, Gombak. This event was an opportunity for employees and families to have a relaxing day out in the vicinity of a tropical rainforest, away from the bustling city and their work.

Despite the unexpected drizzling weather, a total of 32 adults and 14 children turned out for the event. The day started with breakfast prepared by Sheila Shahrur, and was extended due to the rain. Among the foods prepared were "roticanai", fried noodles, sandwiches and desserts to accompany the savory dishes. The delay in outdoor activities was no burden, as it gave employees and their families a chance to socialize and enjoy their time together.

For activities, everyone was grouped into three teams. A variety of games challenged the group both mentally and physically. Each appointed team leader received game instructions and had to convey them to the other team members. The team then planned their strategies for winning the match. The telematch encouraged both leadership and teamwork amongst the group, while allowing participants to have some fun.

The kids were also entertained with games designed for them, such as collecting candy, blowing balloons, spoon races and coconut hockey. Some of the kids also enjoyed playing in the swimming pool.

Exhausted with the games and competition, the entire group revitalized themselves with nasi lemak for lunch. Suhaimi Ismail, Operations Manager, then gave a short speech and presented awards to the winners of the telematch and the prize drawing. The group came together for a photo (above) before parting ways for other activities.

Overall, Family Day was a huge success and we hope to continue to hold events such as these in the future. A special thanks to Norhayati Asmawi and Sheila Shahrur for organizing the event.

Recognitions

INTECSEA ANZ is proud to recognize Linh Le as a finalist in the 2011 WorleyParsons ANZ HSE Awards in April. The awards are made to recognize those who go above and beyond with regard to HSE.

Linh, a subsea engineer, was nominated for his support to HSE, both as part of and outside of his day-to-day role. Linh is an active member of the Safety Leadership Team, a group of volunteers who drive the HSE culture on the Chevron Wheatstone SSFP Project. Linh has shown great promise as he continues to develop as a safety leader for our company and the Wheatstone project.

Congratulations to Linh!

Assessment of Offshore Hydrocarbon Development Options for Arctic and Cold Regions
by Duane DeGeer and Mike Paulin

With the oil industry's continued quest for oil and gas in frontier offshore locations, several developments have taken place in regions characterized by seasonal ice cover and/or iceberg incursions including the U.S. Beaufort, east coast of Canada, North Caspian, and Sakhalin Island. Several more developments are in various stages of exploration or development including projects in offshore Greenland, the Canadian Beaufort, and the Barents Sea. The evaluation of and design for the unique conditions found in these regions is fundamental for the successful execution and safe operation of facilities.

Over recent years, INTECSEA (in cases with the support of parent company WorleyParsons) has completed a number of investigations into offshore hydrocarbon exploration and production options/concepts for ice covered waters. The evaluation of technologies generally covers drilling options, central production facilities, protection of subsea equipment, subsea tiebacks and flow assurance, oil storage, pipelines and tankers (hydrocarbon export), and oil offloading, along with any other client-specified options. Central to the overall development scenario is production concept. This might generally be considered to be a GBS, floater or subsea solution. The determination of concept feasibility must include consideration of water depth, ice conditions (first year ice, multi-year ice, icebergs), wave regime, remoteness, production requirements, storage requirements, hydrocarbon export, installation execution and operations.

The "building blocks" described above can then be used to develop technically reasonable and economically feasible conceptual development plan alternatives or scenarios. These options are then screened to select a "high-graded shortlist", that best meet criteria, which can then be carried forward for further definition and evaluation. This engineering can include

installation requirements, execution planning, operational considerations, hazard identification and risk assessment, cost estimates (including pre-FEED costs, CAPEX, and OPEX), an estimate confidence package and project schedules.

INTECSEA and WorleyParsons are currently carrying out design engineering and construction management on major cold region projects including Shtokman in the Barents Sea, Kashagan in the North Caspian, Arkutan Dagi off of Sakhalin Island and Hebron on the east coast of Canada.

For more information on our Arctic and cold region production concept evaluation capabilities, please contact Mike Paulin (Operation Director, INTECSEA Canada) at **mike.paulin@INTECSEA.com** or Duane DeGeer (Manager of Arctic Projects, INTECSEA Houston) at **duane.degeer@INTECSEA.com.**

INTECSEA Canada Celebrates First Year in Operation
By Mike Paulin, Operations Director, INTECSEA Canada

INTECSEA Canada recently reached the milestone of a full year in operation. We have come a long way over the past year, from an empty space to a vibrant office of more than twenty persons made up of WorleyParsons and INTECSEA staff. The office includes seven INTECSEA engineers and an engineering student intern. The INTECSEA engineers are busy working on two cold regions related Joint Industry Projects (Arctic and Sub-Arctic Subsea Technology and Development of a Trenching System for Subsea Pipelines, Flowlines and Umbilicals in Ice Scour Environments), as well as the FEED for the Hebron GBS Offshore Loading System Pipelines.

For more information on INTECSEA Canada, please contact Mike Paulin at **mike.paulin@INTECSEA.com**.

From left to right: Joe Cocker (Engineer), Erik Veitch (our last student intern), Jonathan Caines (Senior Engineer, Pipelines), Julie Burke (Engineer, Subsea), Prem Thodi (Senior Engineer, Pipelines), Damien Humby (Senior Engineer, Pipelines), and Mike Paulin (Operations Director Canada). Missing from the photo are Scot Croft (Senior Engineering Specialist, Subsea) and Karen Williams (our current student intern).

The Power of You

by John Sanders

A well-established company like INTECSEA is often measured on its history and its future outlook. If you look at our track record, you will see that we have succeeded at resolving some of the most challenging problems faced by the subsea and floating systems industry. But if you destroy the pioneering spirit of our people that led us to the present, then in 10 years the reflection in the pond may not be so sweet. This is where "The Power of You" has an immeasurable impact on the long term viability of our business.

What is "The Power of You"? It is the fire that you bring to your work each day. Its fuel is your desire to be better at what you do at every opportunity. When a company becomes known as the technical leader in an industry like INTECSEA has, it is because people like you are driving success as technical leaders amongst your peers.

The following are the top 5 characteristics of a technical leader. See if you can recognize some of these characteristics in yourself.

1. G-FACTOR. It sounds cool and it's something we all have, but the most technically advanced amongst us have more of it. In 1904, Charles Spearman, an English Psychologist, postulated the idea of quantifying cognitive ability through psychometric testing. The net results of the data would be a person's G-Factor, which is their level of general intelligence, a.k.a. mental wattage. If a person has a high G-Factor, could you extrapolate the notion of them being better at any task given to them? Furthermore, if they focused their superior mental capacity on a solution to a deep-water drilling problem, could they come up with an above average answer? My vote is yes! What is your G-Factor?

2. OPENNESS. In 1999 Professor Fiona Patterson of the City University of London stated, "openness is probably the most important personality dimension to predict a propensity for innovation." Through her studies of innovation in people, she developed the IPI, Innovation Potential Indicator; with openness leading the way. I think it is easy to see why openness is a critical factor to innovation. People, who are trailblazers in any given industry, typically are very perceptive to new ideas, concepts and trends. They collate the input from the different sources and produce a solution. Given that the solution is composed of an exotic mix of ingredients, it is often seen as innovative.

3. VISIONARY. IIf openness is being receptive to external cognitive stimulation, then being visionary is taking that stimulation and imagining all of the possibilities. The Wright Brothers looked at a variety of inputs to imagine a machine that could fly. Their vision was broad and eventually they narrowed it down to a finite application on December 17th, 1903. Keep in mind, the Wright Brothers were not the first to build and experiment with flying machines. But through keen observation, they visualized a machine that could sustain flight and be regulated by the use of controls. Their vision pioneered the multi-billion dollar aerospace industry as we know it today, which is why Dr. David G. Javitch, an organizational psychologist, listed vision as one of the top 10 characteristics of superior leaders in his 1999 op-ed for *Entrepreneur Magazine*.

4. DISAGREEABLENESS. There is a fine line between being disagreeable and difficult. But the type of disagreeable we value is the non-committal attitude towards the status quo from a technical perspective. Leaders often have to make tough decisions requiring a high level of objectivity. In order to do that, they have to be comfortable with not being agreeable. This is where some of the best technical leaders excel. They will not accept a technical solution if they feel there may be one better defined or undefined! They will crunch numbers, analyze data and run tests until they come up with something new and innovative.

5. ENERGY. Strong leaders are often seen conducting mundane tasks with an abnormal sense of vigor. This energy is usually fueled by their passion and their focus on the end result. Their focus is maintained by their ability to believe they can influence an outcome even though it may not seem apparent at the onset. This is what gives them the stamina to set an agenda and follow it through to success.

We are fortunate to have a workforce generously peppered with these positive attributes, which is why you are so valuable to our company. Without your unique set of skills, we would not be on the trajectory of growth. Never underestimate "The Power of You" and your impact on our mission!

For comments and additional information, *please contact Michelle Lang via email: Michelle.Lang@INTECSEA.com.*

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