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# SURVEYOR



**ABS**

# The Joy of Engineering

Projemar celebrates 40 years of innovation and success fueled by love of work.

“Our reputation has been built by people who like what they do,” says Tomazo Garzia Neto, President of the Projemar design company, based in Rio de Janeiro. Projemar is Brazil’s leading company involved in offshore design, but Tomazo, with the invigorating good humor of a man who loves his work, describes the company from a nonstandard point of view. “We’re like an amusement park of engineering,” he says with a smile. “With so many opportunities to work in different areas and solve many different kinds of problems, working here, for a young engineer, is like working in Wonderland.”

Tomazo Garzia Neto,  
President, Projemar



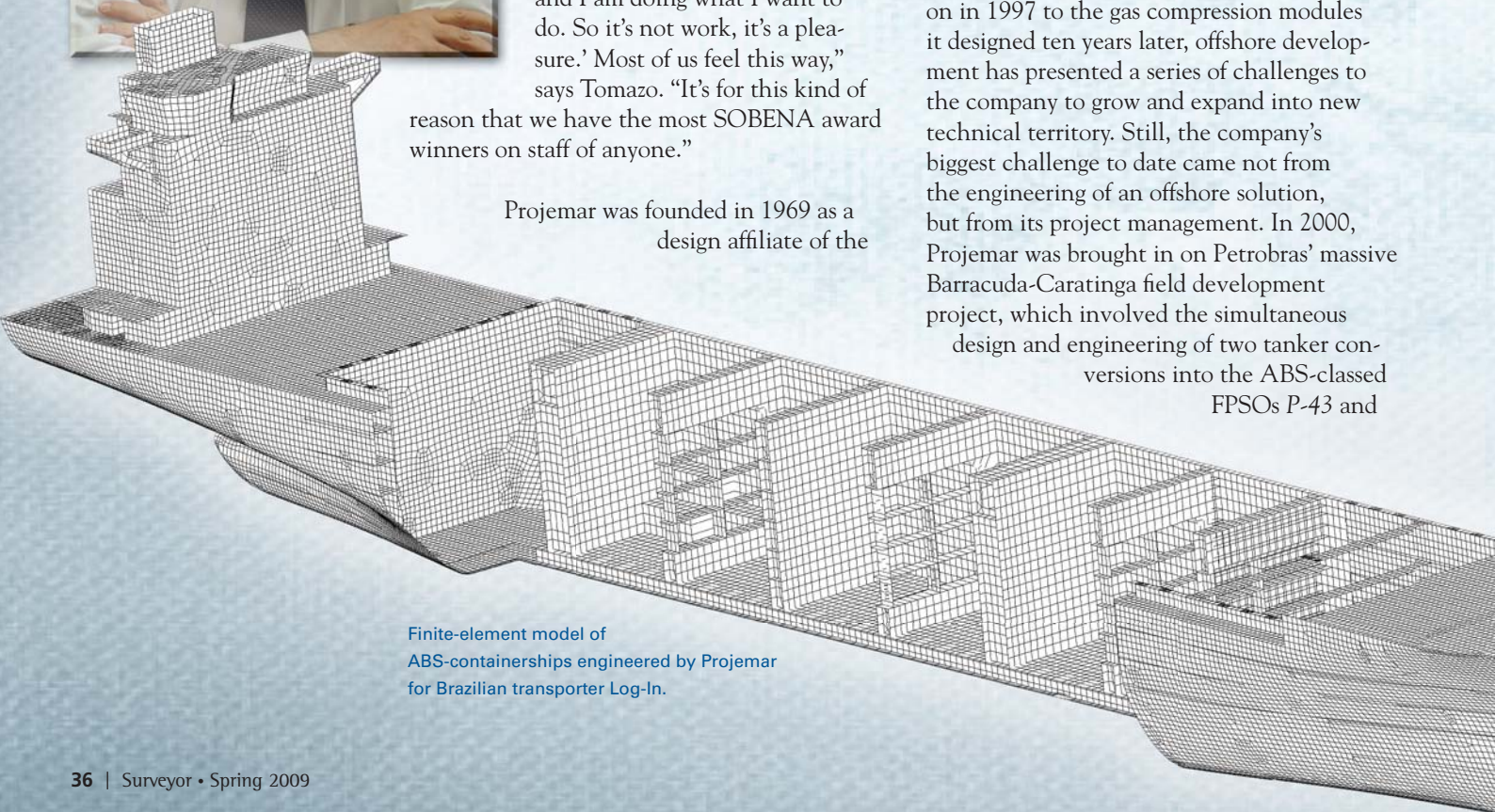
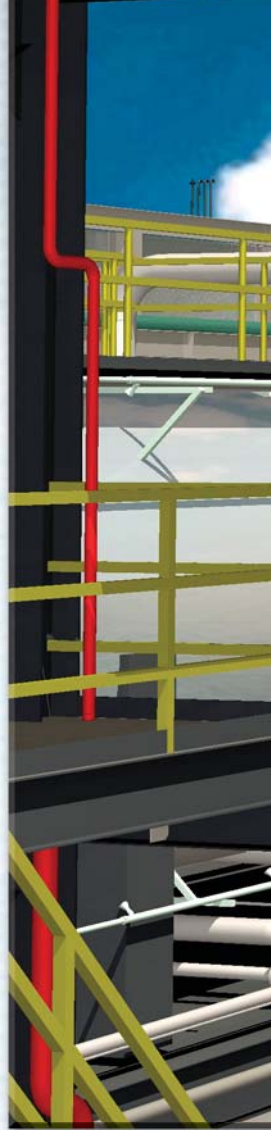
“One of our senior naval architects, Heitor Augusto de Souza Lima, received an award from the Brazilian Society of Naval Architects (SOBENA), and said in his speech, ‘I like engineering and I am doing what I want to do. So it’s not work, it’s a pleasure.’ Most of us feel this way,” says Tomazo. “It’s for this kind of

reason that we have the most SOBENA award winners on staff of anyone.”

Projemar was founded in 1969 as a design affiliate of the

old EMAQ shipyard (today EISA). The company took its current form with a management buyout in 1995 and a migration into offshore design as the Brazilian shipbuilding industry shut down in subsequent years. The company’s offshore work began with engineering services for floating production, storage and offloading (FPSO) units in 1996, when it was hired to perform design analyses on the hull conversion of FPSO P-34, the completion of which was to be the final job for the Ishibras shipyard. Since then, the company has worked on 14 FPSO projects, progressing to full engineering of FPSO conversions, hull design for semisubmersibles and, in 2003, topsides engineering for offshore process and service modules.

From the first moorings it was asked to work on in 1997 to the gas compression modules it designed ten years later, offshore development has presented a series of challenges to the company to grow and expand into new technical territory. Still, the company’s biggest challenge to date came not from the engineering of an offshore solution, but from its project management. In 2000, Projemar was brought in on Petrobras’ massive Barracuda-Caratinga field development project, which involved the simultaneous design and engineering of two tanker conversions into the ABS-classed FPSOs P-43 and



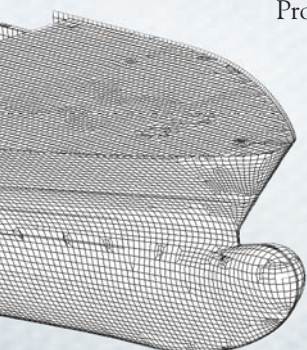
Finite-element model of  
ABS-containerships engineered by Projemar  
for Brazilian transporter Log-In.



P-48, destined for Brazil's Campos Basin. As a single conversion can take 500,000 to 600,000 man-hours of engineering, the company had to expand staff while absorbing new regulations and new Petrobras policies regarding safety and operations.

For Tomazo, the company's most rewarding project was one that began in 2003, when one of the world's biggest iron ore suppliers, Brazil's Vale, issued tenders for design of a 615,000-dwt ore carrier. The challenge was to make this huge ship in such a way that it would not interfere with the logistics chain by delaying other ships at the loading or discharge terminal. The Projemar team solved the problem by tackling it from a different point of view, designing the ship around the cargo operation. In the process, they revolutionized the way people think about ore carriers.

Projemar won the bid with this new concept, which Tomazo calls the "single-pour, single-pass" design – the basic design of which was developed under ABS class.



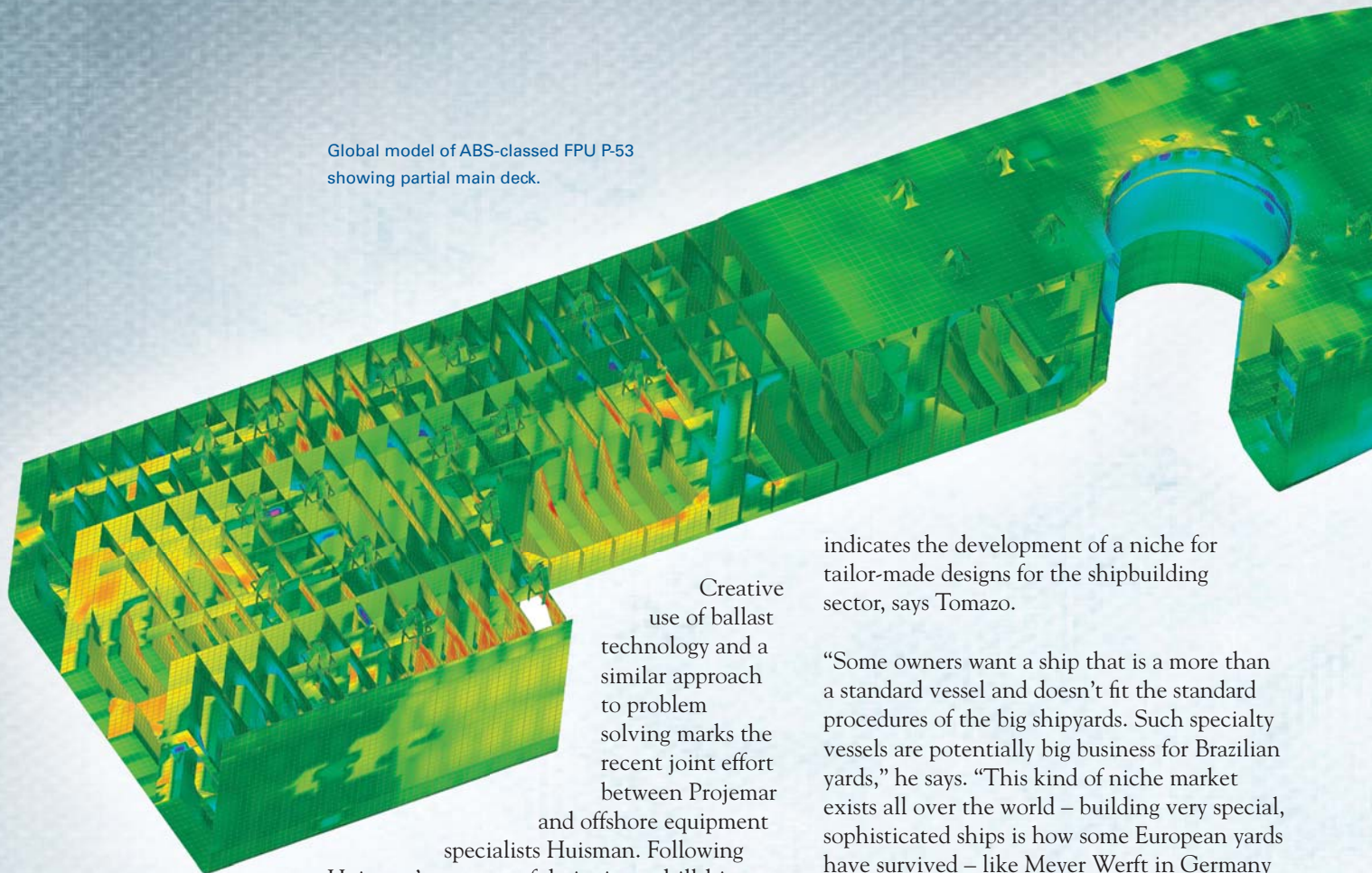
The ship was not yet built, but the concepts developed for the 615,000-dwt ore carrier were the basis of the design of a series of 12 400,000 dwt ore carriers currently building in China for Vale.

These ships will be able to safely take loading rates as high as 16,000 tons of ore per hour. Each of the seven holds is loaded in one pour and the ship is fully loaded in one pass. The amount of extra steel needed over conventional designs: less than one percent. The fundamental secret is a method of ballast control that is synchronized with the cargo operation, scientifically deballasting the ship during loading in a way that balances the forces induced by the incoming cargo.

Projemar also redesigned the cargo hold itself in such a way as to reduce significantly the amount of ore that needs to be removed by secondary means (scrapers, pushers, shovels, etc.) because it is inaccessible to the grab. In the current 12-ship series, the amount of stuck cargo is about 4,000 tons. In the ultra-large ore carriers currently in service, which are just a bit smaller than these, that amount is about 30,000 tons.

3-D engineering model showing the starboard view of the process plant aboard Petrobras' FPSO P-47. The artistic engineer won the Second Place award in the Rendering Category of Intergraph's Golden Valve 2004 competition.

Global model of ABS-classed FPU P-53 showing partial main deck.



Creative use of ballast technology and a similar approach to problem solving marks the recent joint effort between Projemar and offshore equipment specialists Huisman. Following

Huisman's concept of designing a drillship around the drilling equipment, Projemar delivered the basic design of the revolutionary *Huisdrill 10000* compact deepwater drillship. One example is now contracted with the STX shipyard in Dalian, where it will be built to ABS class.

While some of Projemar's advances seem to spring from mad inspiration, many come from good old-fashioned hard work and research. In fact, the company has an active program of joint research and development initiatives, including: investigations into computational fluid dynamics with the University of Rio de Janeiro; studies on the seakeeping of supply vessels and high-performance ships with the University of São Paulo model basin (IPT); and analyses of current-induced loads and motions of offshore structure through a joint industry project with Holland's Gusto Engineering and the MARIN research facility. "Our main focus is engineering, and to be very good at engineering you need to be involved in research," says Tomazo.

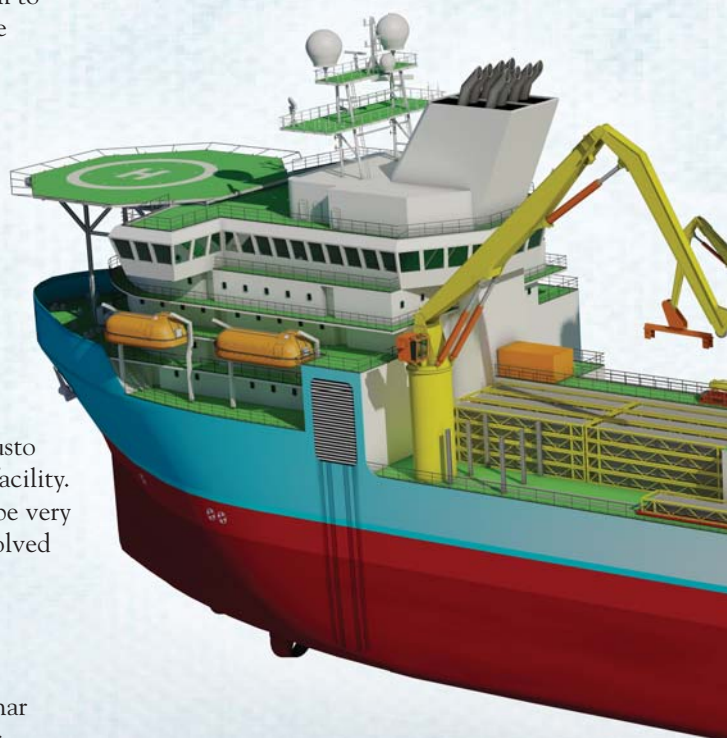
### Investing in People

With Brazil's shipbuilding boom, Projemar has returned to its roots with designs for tankers, bulk carriers and containerships in nearly every active shipyard in the country. One standout aspect of this work is that it

indicates the development of a niche for tailor-made designs for the shipbuilding sector, says Tomazo.

"Some owners want a ship that is a more than a standard vessel and doesn't fit the standard procedures of the big shipyards. Such specialty vessels are potentially big business for Brazilian yards," he says. "This kind of niche market exists all over the world – building very special, sophisticated ships is how some European yards have survived – like Meyer Werft in Germany with the cruise ships.

"Niche work is not very interesting to the big yards, which focus on standard designs in large series, but there are also many shipowners that need specialty ships built in relatively small series," he explains. "For example, one of the



shipyards in Brazil is presently building a self-unloading gypsum carrier for an American owner. This is the kind of solution that Brazilian shipbuilders can provide.”

He points to a series of five containerships Projemar designed for Brazilian transporter Log-In (Logistica Intermodal SA), now building in Brazil to ABS class. With a 2,800-teu capacity, the ships are specially designed for Brazilian cabotage: moderate design speed of 20 knots, low volume of reefer containers and high maneuverability to accommodate the many Brazilian ports still in a developmental stage.

Specialty cargoes comprise another niche area that Brazilian yards could exploit, he says, using as example a group of integrated tug-

barges for Brazilian cargo carrier Norsul, all built in Brazil under ABS class. One tug-barge set is designed specifically to carry logs that will be used to produce pulp; another set will transport the pulp from a pulping mill to a hub port for further transport; and the third set is for transporting steel coils along the coast – an example of an increasing green trend in Brazil to take cargoes off the road and get them into ships.

Whatever the challenge, says Tomazo, it can be conquered through positive will and hard work – and, if you’re lucky, helped to its conclusion by that extra power that springs from good feeling within, which often takes the form of inspiration. “Success isn’t all a matter of making money. Of course, you want to do this too, but the main driver is that you must like what you do,” he says. “So, we just try to create a corporate culture that inspires the people and gives them incentive to achieve.”

Projemar has an active outreach program with various universities, often hiring engineers shortly before graduation and helping them establish a career path within the company. For a year or two, the students work for short periods during the week. Then they get working and go to school one or two days a week to work on their Master’s degree.

“We have a guiding principal that we try to follow, which is to be a responsible company at the forefront of engineering,” says Tomazo. “Because of this, we have been able to accept new challenges and succeed in new areas. In 1996, for example, we had never designed a mooring system for any kind of platform. Today we do topsides engineering. We accept the jobs, send our people abroad to study and invest in software and training. We invested in our people and now we have a fantastic reputation in design. That’s it. No secret. And today there is no challenge that Projemar cannot accept.”

Rendering of Huisman's revolutionary HUISDRILL 10000 drillship, engineered by Projemar.

