IMarEST Houston (US Gulf Coast) Branch 2025 Conference – Next-Gen Marine Offshore Technologies: Driving Sustainable Solutions for Energy Expansion, Efficiency, and Emission Reduction

Summary of the Day's Proceedings

The IMarEST 2025 Conference held at the Microsoft Technology Center in Houston brought together leaders, innovators, and experts from across the marine, offshore, and energy sectors for a landmark day of discussion and collaboration. Under the theme "Driving Sustainable Solutions for Energy Expansion, Efficiency, and Emission Reduction," the event was more than just a meeting of bright minds — it was a moment to shape the direction of our industry's future.

Across keynote addresses, from the IMarEST Houston Chairman and Chief Energy Advisor, Dr. Nimi Abili who declared the conference opened, to IMarEST President, Professor Stephen de Mora, Cinnamon Edralin, Michael Kei, Dr Ram Shenoy, Ove Heitmann Hansen, Steven Putnam, Jorge Peña Alarcón, Rajnish Kelkar, Jennifer Harrison, Roger Burnison, Julian Moreno, and the IMarEST Houston Honorary Secretary, Dr Paul Jukes, to panel sessions, and networking discussions, one message resonated clearly: our industry is evolving faster than ever — and we are the ones shaping that evolution. From transformative technologies and alternative fuels to workforce development and the rise of digital ecosystems and agentic AI for hyper-automation, the conversations offered not only vision but also clear, actionable pathways to meaningful change.

Session 1: Emission Reduction and Energy Transition

The conference opened with a deep dive into one of the most urgent priorities of our time: reducing emissions across the marine

and offshore value chain. Presenters, including Oghenekevwe Ovbije, Michiel Heuven, Pavan Nimmagadda, Charles White and Peter Wallace, outlined the progress being made with a wide range of solutions, from LNG and ammonia to hydrogen, pressurized LNG (PLNG), advanced fuel additives and low-carbon technologies. What was once the subject of feasibility studies and small pilot projects is now moving decisively toward large-scale deployment. These technologies are not only helping to reduce lifecycle emissions, but also redefining what operational sustainability looks like for ships, offshore platforms, and subsea systems.

A central takeaway was clear: decarbonization is no longer optional — it is a strategic imperative. Yet achieving this transformation will demand far more than technology alone. The sector must address regulatory complexity, ensuring global alignment on standards and compliance. It must foster cross-sector collaboration, bringing together operators, regulators, technology developers, and financiers to accelerate deployment. And it must secure significant investment, enabling scalable infrastructure for fuels, storage, and carbon capture.

The message was unmistakable: success will depend on the pace at which the industry can turn innovation into implementation — and on its ability to align stakeholders around a shared vision of a net-zero future.

Session 2: Digitalization and Efficiency — Transforming Offshore Operations

The second session focused on how digital transformation is reshaping the future of marine and offshore operations. Speakers, including Dr Bulent Mercan, Greg Trostel, Rajni Jaipaul, Ola Drange Veglo, Dhivakar Poosapadi and Cosmin Bozenovici, highlighted the increasing role of advanced technologies — including artificial intelligence (AI), robotics, edge analytics, and autonomous systems — in driving efficiency, reliability, and safety across the lifecycle of offshore assets. These technologies are not only enhancing real-time decision-making and predictive capabilities, but also enabling operators to maximize the performance and availability of critical infrastructure.

A recurring theme was the transition from concept to practical application. Digital twins, once considered a cutting-edge innovation, are now mainstream tools for monitoring system health, optimizing maintenance, and extending asset life. Predictive analytics help operators anticipate issues before they occur, while automation is streamlining complex workflows and reducing operational risk.

At the same time, presenters underscored the importance of building trust in increasingly complex and interconnected digital ecosystems. As more critical decisions become data-driven, ensuring the integrity, security, and reliability of these systems is essential. The message was clear: digitalization is no longer a support function — it is a strategic enabler of operational excellence and a key driver of competitive advantage in the energy transition.

Session 3: The Next-Generation Workforce

While technology is accelerating

change, the conference made it clear that people remain at the heart of the industry's future. This session focused on the urgent need to attract, develop, and retain the next generation of engineers, scientists, and maritime professionals — a challenge that is critical to ensuring long-term innovation and sustainability.

Speakers, including Chiedozie Ekweribe, Julie Ingram, Adam Reeves, Cameron Worthington-Wilmer and Jacqueline Di Crisci, shared strategies for closing the skills gap, from early engagement with students and strong partnerships with universities to the creation of structured mentorship, internship, and graduate programs. Building awareness of career opportunities in marine and offshore engineering was highlighted as a top priority — not only to secure future talent but also to promote diversity of thought and perspective in solving complex global challenges.

A powerful takeaway was that talent development is a shared responsibility. As one speaker put it, "We are all recruiters." Every professional in the industry — from senior leaders to early-career engineers — has a role to play in inspiring and mentoring the workforce of tomorrow. Equipping this next generation with the technical skills, leadership qualities, and sustainability mindset needed for the future will ensure that the industry continues to evolve, innovate, and thrive.

Session 4: Big Data, Digital Twins, and AI — Unlocking New Potential

The final session explored how the convergence of big data, IoT, digital twins, and AI is transforming offshore operations and delivering unprecedented levels of insight, efficiency, and safety. What was once experimental technology is now at the core of how the industry monitors, manages, and optimizes complex systems — from subsea infrastructure and FPSOs to pipelines and risers.

Speakers, including Dr David Knezevic, Dr Prabu Parthasarathy, Senthil Arcot, Erik Leung and Rafael Riva, showcased how data-driven technologies are enabling predictive maintenance, reducing unplanned downtime, and optimizing asset life cycles. Digital twin are now used not just for visualizing system performance, but for simulating real-world scenarios, seeing around corners of assets, evaluating design decisions, and informing operational strategy. Combined with AI, these tools are allowing companies to make more accurate, proactive, and strategic decisions than ever before.

Another recurring message was the importance of the human-machine interface. While automation and advanced analytics are transforming how decisions are made, human oversight remains essential to ensure that these systems are applied safely, ethically, and effectively. This balance — where human expertise and digital intelligence work together — will define the next generation of offshore operations and underpin the industry's ability to adapt to a rapidly changing energy landscape.

So What? – Turning Insights into Action

Reflecting on the ideas, innovations, and perspectives shared throughout the conference, one question naturally arises: "So what?" Why do these discussions matter — and how will they shape what comes next?

The answer is clear: knowledge alone is not enough. The true success of the event will not be measured by the number of sessions held or the quality of the presentations delivered, but by what each of us does after the conference. The technologies, strategies, and frameworks presented are powerful — but they will only make a difference if they are translated into real-world insight-driven action.

The Big Picture Impact

The conference made one thing abundantly clear: our industry now has the technology, the talent, and the vision to transform itself. Decarbonization, digital integration, and new ways of working are no longer distant ambitions — they are happening now, and they are accelerating.

However, incremental change will not be enough. We must scale solutions, embrace bold decision-making, and embed sustainability and digital intelligence into every part of the value chain — from concept design through operations and decommissioning. What we do — in Houston, in the Gulf of Mexico, and around the world — will directly influence the pace of decarbonization, the success of energy transition, and the resilience of global infrastructure. We are not just participants in this transformation; we are its drivers.

A Call to Action

The event's real legacy will be determined not by the ideas shared, but by the actions taken. Every keynote, panel, and discussion created opportunities — to rethink design philosophies, forge new partnerships, shape regulations, and set new standards for the next generation of offshore engineering.

The challenge is this: take one idea and make it real. Turn one conversation into a collaboration. Champion one bold con

cept within your company, your university, or your organization. If each of us drives just one initiative forward, the cumulative effect will be transformative. The question is no longer whether we can change the future — but whether we are ready to lead it.

A Stronger Community

The conference also reinforced the fact that we are more than an industry — we are a community. The challenges ahead — from climate adaptation to workforce development and cybersecurity — are too complex for any single organization, discipline, or nation to solve in isolation.

True progress will require collaboration across traditional boundaries: operators and suppliers, academia and industry, regulators and innovators must work together. Shared data, joint standards, and coordinated strategies will accelerate progress. Through mentorship, outreach, and knowledge-sharing, we can build a legacy that extends beyond individual projects or careers — one that strengthens the entire sector and benefits society as a whole.

Inspiring the Future

Each of us has the power to shape the future — not just through technology, but by investing in people. Mentoring a student, coaching a junior engineer, or supporting a colleague's journey toward professional recognition are ways we can all contribute to the industry's long-term strength and resilience.

Professional recognition through the IMarEST, such as CEng, CMarEng, Membership, or Fellowship — represents more than a credential. It is a mark of leadership, responsibility, and commitment. Continuous Professional Development (CPD) is more than a requirement — it is the foundation of lifelong learning and growth in a rapidly changing sector.

Closing: A Vision of Optimism and Purpose

The future will not wait — and neither should we. The ideas, technologies, and partnerships explored at the IMarEST Houston 2025 Conference have the power to reshape our world. Now is the time to act, to lead, and to build the sustainable, efficient, and resilient marine and offshore industry the world needs.

As we look back on this landmark event, the challenge is to move beyond reflection and into implementation. Together, we can build an industry that is smarter, cleaner, more resilient, and more sustainable — one that not only meets the challenges of today but anticipates the opportunities of tomorrow.

The future of marine and offshore engineering is in our hands. Let's shape it — with courage, collaboration, and a shared vision for a better world.

— Dr. Paul Jukes PhD, CEng, CMarEng, FIMarEST

Honorary Secretary, IMarEST Gulf Coast Branch