DETAILED PROGRAM

As of: July 15, 2025

SMC PRE-CONFERENCE

PRE-CON Courses 1-4 are eligible for PDH Credits (certification to New York State requirements is pending).

Wednesday, October 29, 2025

TIME	PROGRAM	Location
7:00 AM – 7:00 PM	Registration OPEN	3rd Fl. Foyer
8:00 AM – 5:00 PM	**FAST Symposium**	Momentum & Fusion Rooms
8:30 AM – 12:00 PM	**SNAME Student Session** (Shipyard Tour)	Offsite
9:00 AM – 10:30 AM	HHS Volunteer Orientation & Student Arrival	MAIN FGH
9:00 AM – 5:00 PM	**PRE-CON Course – 1-AM: Orca3D: Marine Design in Rhino** **Speakers: Bruce Hays & Larry Leibman** In this half-day hands-on course, students will learn to use the Orca3D marine design and analysis plugin for Rhino. We will cover the areas of hull design and fairing, basic hydrostatics and stability, resistance prediction, and weight tracking, along with particular emphasis on Orca3D's latest intact and damaged stability analysis capabilities for vessel designs with internal compartmentation, all within the Rhino environment. Students will learn to create a compartmentation model, define fixed load groups, create and modify load cases with fixed and fluid loads, include free surface of fluids in tanks, define stability criteria and heeling moments, and will perform intact and damaged stability analyses. In addition, we'll cover floodable lengths, curves of form, tank tables, tonnage calculations, and area/volume reports. Students should bring a laptop with Rhino 7 or 8 and Orca3D v3 already installed. Prior to the course, registered students will be given instructions on how to load free trial licenses of both if necessary. **PRE-CON Course – 1-PM: Orca3D Marine CFD: Accurate, Practical Computational Fluid Dynamics (CFD) for the Naval Architect** **Speakers: Bruce Hays & Larry Leibman** In this half-day interactive course students will learn to use Orca3D Marine CFD, based on the SimericsMP RANS CFD code. Students will gain a basic understanding of CFD, with practical examples of resistance and self-propelled simulations in calm water for various types of vessels, including displacement, high-speed displacement, planing, and fully submerged. The course will cover the process of setting up a simulation in Orca3D, including a discussion of the geometry requirements and the surface and volume meshing parameters. Then the students will learn how to run the simulation in SimericsMP, create a report summarizing the results, and create a rendering in Rhino using Orca3D. Best practices for grid convergence will be discussed, as well as appropriate applications of local mesh refinement. More advanced examples of simulations in waves, turning simulations, and analyzing dynamic instability such as porpoising will be presented. Students should bring a laptop with Rhino, Orca3D, and SimericsMP installed. Prior to the course, registered students will be given instructions on how to load free trial licenses for all three software packages.	Energy Room

TIME	PROGRAM	Location
9:00 AM – 5:00 PM	**PRE-CON Course 2: SAWE Course** **Speaker: David Hansch** This course exposes students to the fundamentals of marine vehicle weight estimating. This includes a review of the weight estimating methods described in SAWE Recommended Practice 14 "Marine Weight Estimating & Margin Policy Guideline". The class will cover the theory, and application of weight estimating methods on specific examples and for whole ship design. The appropriateness of each method for each stage of ship design, construction and operation will be discussed. The students will work examples to estimate the weight of a vessel using multiple methods. Historic examples of weight estimating errors will illustrate practices to avoid. Students will receive estimation resources including several papers, weight reports for a number of vessels and an updated version of the Compendium of Parametric Weight Equations that the instructor previously presented at SNAME and SAWE conferences. Finally, the class will collectively derive a parametric weight equation to illustrate the process and the highlight pitfalls to be avoided in the development of parametric estimating equations.	PDF Center
9:00 AM – 5:00 PM	**PRE-CON Course 3: Seakeeping Short Course for Engineers** **Speakers: Dr. Ahmed Ibrahim & Dr. Carolyn Judgee** This course provides engineers with a focused understanding of seakeeping, essential for designing vessels that perform efficiently in various sea conditions. Participants will explore wave-ship interactions, motion prediction techniques, and design strategies that enhance stability, comfort, and operability at sea. Key topics include: • Wave dynamics and their influence on ship behavior • Degrees of freedom in vessel motions (heave, pitch, roll, yaw, sway, surge) • Computational models for seakeeping analysis and performance assessment • Hull design and damping solutions to minimize adverse effects of waves • Practical applications in naval architecture, offshore engineering, and maritime operations By the end of this short course, engineers will have an overview of the seakeeping subject, reducing motion-related risks, and ship operation in challenging marine environments. This knowledge is valuable for ship designers, naval engineers, and maritime professionals working on advanced vessel technologies.	Imagination
9:00 AM – 5:00 PM	**PRE-CON Course 4: Stability Evaluations with GHS** **Speaker: Lucas Hurt** Try your hand at some more advanced stability aspects using General Hydrostatics (GHS) software by Creative Systems. • The course will cover the following topics: Programming language features: variables, macros, functions, and SET and IF commands • Use of ground points • Modeling and analysis of small boats with open cockpits We will learn how to create, assign, print, and do mathematical operations and string manipulations with variables. Similarly, the course will cover how to define macros and functions in run files and use them to build powerfully flexible run files. Both of the above techniques are used in an example exercise, creating a summary data file for a series of cases in CSV format. The course will cover the theory that governs what a ground point is and how it behaves in GHS. Once the syntax is familiar and the significance of each parameter is understood, we will practice setting two scenarios with different known quantities. In the first case, the water depth at each key location is known. In the second case, we know the loading condition as well as the grounded freeboards. Learn how to model small boats with swampable deckwells and how to assess their stability. See the difference between modeling the deckwell into the hull or modeling the deckwell as a tank. Use an inverted ground point to depress the gunwhale until the deckwell floods. Then assess the hydrostatic stability of the vessel. These techniques apply to ISO small boat stability standards.	Adrenaline Room
10:30 AM – 11:00 AM	High School Student Welcome/Orientation	MAIN FGH
11:00 AM – 2:30 PM	High School Student Speed Networking / Ship Tours	MAIN FGH & Offsite

TIME	PROGRAM	Location
1:00 PM – 3:00 PM	**Student Design & Build** ***Sponsored by: NETSCo***	MAIN A
2:00 PM – 3:00 PM	**Student Section Advisors Committee Mtg**	MAIN BC
4:30 PM – 6:00 PM	**SNAME Student Session** 4:00 PM – 4:20 PM **ST-1 (SMC-063) TRACK: Student** **Development Methodology for Integrated Vessel Route Optimization Toolkit** **Speaker: TBD** The Integrated Vessel Route Optimization Toolkit (IV-ROT) is a real-time, decision-support system designed to optimize maritime routes by balancing fuel efficiency, transit time, and regulatory compliance. It integrates a physics-based ship resistance model (calm-water drag, wind, wave, and shallow water effects) with a modified weighted, bidirectional A* algorithm. IV-ROT utilizes ERA5 environmental data and ENC-based vector graphs to compute dynamic edge costs. A GUI enables user-defined biasing between voyage objectives. Applied to the Vizhinjam (India)–Salalah (Oman) route, IV-ROT demonstrates significant fuel savings and adherence to IMO EEXI/CII standards, offering a robust and sustainable alternative to traditional routing methods. 4:25 PM – 4:45 PM **ST-2 (SMC-095) TRACK: Student** **Methodology for Assessing OSV Structure for Specialized Service Adaptation** **Speakers: Angel Baez & Jose Hernandez** Offshore Support Vessels (OSVs) are essential tools in oil, gas and wind energy operations. These vessels must adapt to various kinds of work, often requiring the installation of equipment for specialized services. The installation of that equipment, especially heavy items like cranes, can affect the deck structure and stability. For this reason, a structural analysis is necessary to ensure operational safety and protect the integrity of the crew. This article proposes an iterative methodology for the structural assessment of the main deck of an OSV. The analysis considers the loads applied by a crawler crane mounted on the main deck and dynamic scenarios defined according to the API 2C Specification. The structural assessment is performed using Finite Element Method (FEM) analysis, following acceptance criteria based on ABS Rules. The iterative nature of the methodology ensures compliance with the acceptance criteria and allows for the redesign of the structural arrangement when necessary. 4:50 PM – 5:10 PM **ST-3 (SMC-096) TRACK: Student** **Innovation in Onboard Wastewater Management for Maritime Sustainability** **Speaker: TBD** Improper discharge of wastewater from vessels is a major source of marine pollution, affecting ecosystems, spreading disease, and generating negative economic impacts. This study analyzes solutions based on onboard treatment plants and green ports, evaluating innovative technologies. Implementation models and their impact on maritime sustainability are presented. The results indicate that the adoption of these solutions can significantly reduce pollution, highlighting the importance of strict regulations and technological strategies in efficient wastewater management in the maritime industry. 5:15 PM – 5:35 PM **ST-4 (SMC-098) TRACK: Student** **Preliminary Sea-Chest Sizing from Grating Intake Velocity and Cooling Requirement** **Speaker: Winston Hoffman** Sea-chest sizing is a process that is often based on rules of thumb rather than a set scientific method. This paper aims to create such a method by incorporating real world data and sound engineering principles. Specifically, the use of example species to set a flow velocity that will avoid impingement on fish, comparing engine indicated power to obtain an early estimate for flow rate, and ratio of open area to grating area to size the sea-chest. The main use case of this method is for future Marine Mechanical Design students to size sea-chests on their third-year project vessels.	MAIN BC
5:00 PM – 7:00 PM	**FAST Symposium – Reception**	3rd Fl Break Area

TIME	PROGRAM	Location
6:00 PM – 9:00 PM	**President's Reception** & Student Design Competition ***Sponsored by: NETSCo***	MAIN & Foyer

FAST SYMPOSIUM
Wednesday, October 29, 2025

TIME	PROGRAM	Location
7:30 AM – 8:00 AM	Registration	3rd Floor Foyer
8:00 AM – 8:40 AM (40 Minutes)	**BREAKFAST & Keynote Session** Title Speaker: Dr. Chris Kent	Momentum Room
8:45 AM – 9:15 AM (30 Minutes)	**Session 1**	
	S1-A **(SMC-009)** **TRACK: Concept Design** **A Narrow-Bottomed Wave Climatology for the Design of Fast Craft** **Speaker: Sean Kery** Many fast manned and unmanned craft are sensitive to increasing wave height as well as to specific wave height versus wave period combinations. There are many conflicting sea state tables (Wilbur-Marks, Pierson-Moscowitz, NATO 4194, Beaufort, and others) in use by different users and Commands. This paper presents new tables of wave condition probability of occurrence that are specifically geared to the design of small fast craft and other projects that are sea condition limited.	Momentum Room
	S1-B (SMC-019) TRACK: Maneuvering **Maneuvering and Control Simulations of a Hovercraft** **Speakers: Shivani Sakri & Stefano Brizzolara** Air cushion vehicles are unconventional vehicles that employ an air cushion under the hull allowing them to travel on different terrains making them highly maneuverable even at low speeds. The mathematical model developed in the study is capable of predicting the maneuverability of the air cushion vehicle. The dynamic model uses equations that account for surge, sway, and yaw motions of the craft. The influence of rudder, and duct propeller force, aerodynamic forces and dynamic coefficients on vehicle maneuverability have been considered. The results have been compared with in-field trials and provide valuable insight towards model calibration.	Fusion Room
9:20 AM – 9:50 AM (30 Minutes)	**Session 2**	
	S2-A (SMC-035) TRACK: Resistance **Resistance Reduction by Air Cavities on a High-Speed Craft** **Speaker: Oleksandr Zverkhovskyi** Air lubrication is an effective method for reducing the frictional resistance encountered by marine vessels. The Damen Air Cavity System (DACS) achieves this by decreasing the wetted surface area of the hull, thereby lowering hydrodynamic resistance. This study investigates the implementation of air cavity system on a high-speed catamaran, which features a non-flat bottom geometry. The findings indicate that the application of air cavities can reduce the vessel's resistance not only in calm water conditions but also in the presence of waves. Furthermore, the study outlines the limitations associated with the applicability of the system.	Momentum Room

TIME	PROGRAM	Location
	S2-B (SMC-077) TRACK: Hydrodynamics **Experimental Investigation of Seaplane Forebody Chine Details** **Speaker: TBD** Spray generated by seaplane hulls during taxi, takeoff, and landing can be significant and its consequences can be critical to craft safety, availability, and service life. While both whisker spray and main blister spray are generated, the main blister spray is of higher interest, as it is a denser spray sheet whose apex is higher than the whisker spray (Savitsky and Morabito 2010). Spray is a crucial design consideration for flying-boat hulls in both calm water and rough water operations, whose main blister spray may impact propellers, engine inlets, aerodynamic lifting surfaces, and aerodynamic control surfaces. This impact may cause loss of efficiency or damage, both of which degrade the capability and availability of the seaplane. Seaplane craft currently in operation have considered complex forebody chine treatments to suppress the bow spray generated. These past efforts, notably past experimental results (Kikuhara June 1960) and (Shin Meiwa Industry Co., LTD. 1961) and operational craft implementation focus on one dimension of the problem, which is mitigating the spray and comparing spray blister envelopes, without expanding upon the impact to craft performance. This paper presents results acquired during tow tank testing of two forebody chine shape alternatives at the Stevens Institute of Technology's Davidson Laboratory in calm and rough water. The results consider each model's impact on the spray envelope, hydrodynamic drag, longitudinal stability, seakeeping motions, and seakeeping accelerations and present the tradeoffs observed between spray patterns resulting from different mitigation approaches and the resultant craft performance.	Fusion Room
9:55 AM – 10:25 AM (30 Minutes)	**Session 3**	
	S3-A (SMC-075) TRACK: Machine Learning - Resistance **Integrating Hydrodynamics and Neural Networks for Planing Hull Drag Prediction** **Speakers: Junior Allebrandt, Tancredi Altamiro & Pontin Thiago** *This paper delineates a machine learning pipeline meticulously crafted to optimize ship performance prediction through the integration of sophisticated validation techniques, neural network architectures, and model selection strategies. The pipeline employs Leave-One-Out Cross-Validation (LOOCV) to ensure robust generalization, generates interpretable performance reports, and automates the selection of optimal models based on composite scoring. Additionally, the primary intent of this pipeline is to enable shipyards to utilize their proprietary data in a user-friendly manner, thereby obtaining sufficiently accurate results for preliminary studies prior to committing to more comprehensive development. Drawing on methodologies from computational naval architecture and machine learning literature, the framework addresses critical challenges in model reproducibility and scalability. The functionality of the code is demonstrated through a case study on hull performance prediction, underscoring its applicability to fast sea technology research.*	Momentum Room
	S3-B (SMC-054) TRACK: Maneuvering **MF-MMG Prediction of High-Speed Planing Hull Turning Circles** **Speaker: Hironori Yasukawa** A method for predicting the maneuvering motion of a planing hull is proposed based on a 4-degree-of-freedom equation of motion (surge-sway-yaw-roll) in a ship-fixed coordinate system. The hull hydrodynamic/hydrostatic forces are expressed using a derivatives form. The forces and moments required for the predictions are calculated using captive-CFD. The derivatives obtained from the calculated forces and moments are stored for several ship speeds, and the derivatives for the arbitrary ship speed are calculated by an interpolation technique. The turning for a 12.88m length planing hull called GPPH is calculated by changing the steering angle from -5° to -25°. The approach ship speed is 20.5 m/s. The simulation results are compared with the free-run-CFD results. At relatively small steering angles from -5° to -15°, the results showed good correspondence with the free-run-CFD results. However, at relatively large steering angles of -20° and -25°, the present simulations were unable to capture the sudden decrease in ship speed and the small turning circle with the large drift angle that were shown by the free-run-CFDs. In the future, it is necessary to clarify the mechanism of the sudden decrease in ship speed and improve the present simulation model.	Fusion Room
10:25 AM – 10:55 AM	**BREAK**	Foyer

TIME	PROGRAM	Location
11:00 AM – 11:30 AM (30 Minutes)	**Session 4**	
	S4-A (SMC-079) TRACK: Maneuvering/Seakeeping **A Computationally Efficient Seakeeping and Maneuvering Formulation for Planing Vessels** **Speaker: TBD** This paper describes a formulation for predicting the 6-degree of freedom motion of a self-propelled planing vessel. The current simulation runs in near real time (10% slower) on a single core of a 2.1 GHz processor and demonstrates good agreement to high-fidelity simulations. Accurate seakeeping results are demonstrated in head and quartering waves relative to high-fidelity methods and experimental data. Self-propelled turning circle maneuvers are simulated for various steering angles in calm water and in waves. The current method demonstrates an overall agreement to high-fidelity CFD maneuvering results in predicted turning circle trajectory.	Momentum Room
	S4-B (SMC-014) TRACK: Propulsion **Experimental Validation Study of the BEM for Supercavitating Propellers** **Speakers: Surabhi Srivastava & Stefano Brizzolara** A systematic study was conducted to experimentally validate the performance prediction capabilities of the Boundary Element Method (BEM) for supercavitating propellers with truncated trailing edges (TE). The study focused on steady super cavitating conditions and utilized the propeller test data of TMB 3767. A mesh sensitivity analysis and point distribution study was conducted to determine an optimum mesh for the propeller geometry and the treatment of the blunt TE. The predicted performance parameters and cavitation patterns were compared to those from the experimental data. Additionally, a study was conducted to evaluate the influence of cavitation index on the predicted performance parameters.	Fusion Room
11:35 AM – 12:05 PM (30 Minutes)	**Session 5**	
	S5-A (SMC-022) TRACK: Concept Design **Early-Stage System-Level Optimization for an Electric-Drive Fast Monohull** **Speaker: TBD** The advantages of early-stage design space exploration (DSE) are well-recognized in the fast ship design community. DSE can significantly influence both fundamental design and business decisions, and it can enhance the effectiveness of subsequent simulations that employ resource-intensive higher-order codes. This study examines the potential of resource-efficient reduced-order simulation via parametric prediction models to provide valuable early-stage DSE. A systematic comparison will be given to an existing comprehensive 11-meter planning craft R&D project (AutoPlan). The reference project included viscous CFD predictions, towing tank tests, and full-scale sea trials. Hull form parametric variants are developed using the CAESES® shape optimization platform and will be coupled with the NavCad® hydrodynamic and propulsion system simulation tool rather than CFD for performance simulation. The goal is to follow the same design path as the previous R&D project for side-by-side comparisons of outcomes and resource expenditures, while also enhancing the prior project by evaluating the system simulation through the energy demands of an electric motor drive, replacing conventional diesel engines.	Momentum Room
	S5-B (SMC-036) TRACK: Seakeeping **Open Water Free-Running Model Testing for High-Speed Craft Hydrodynamics** **Speaker: TBD** The hydrodynamic and hull performance of High-Speed Craft (HSC) are often evaluated in costly, restricted environments such as towing tanks, which limit vessel motion and do not replicate real-world sea conditions. Free-running outdoor model testing provides a cost-effective alternative, allowing full six degrees of freedom in natural environments. This study presents the development of a scaled free-running model incorporating a propulsion system, data acquisition system, and environmental monitoring methods. Preliminary tests were conducted at Texas A&M University's Offshore Technology Research Center (OTRC) and Lake Bryan, Texas, United States, with additional system validation at Lake Somerville, Texas, United States.	Fusion Room
12:15 PM – 1:15 PM	**LUNCH**	Foyer
1:20 PM – 1:50 PM (30 Minutes)	**Session 6**	
	S6-A (SMC-056) TRACK: Concept Design **Design Concerns for Flying-Boats** **Speaker: Michael Morabito**	Momentum Room

TIME	PROGRAM	Location
	This paper discusses some practical aspects of flying boat design, which may come up as a design progresses beyond the concept stage. These include more detail on bottom loading, impact accelerations, spray intensity, the nature of porpoising instability, the use of standard series and tip float design. A complete set of standard series design calculations is provided.	
	S6-B (SMC-101) TRACK: Seakeeping **Marine Free-Surface Extension to a Modern Neumann Panel Method** **Speakers: Jeremiah Goates, Cory Goates & Vivek Ahuja** The purpose of this work is to present the development of a marine free-surface panel method. A freestream linearized boundary condition and corresponding wave elevation is presented. Wave resistance is calculated using pressure integration or wave cut analysis. The processes for setting up the AIC, satisfying the radiation condition, and choosing and placing singularities are presented. The method for satisfying the radiation condition used here is novel and flexible.	Fusion Room
1:55 PM – 2:25 PM (30 Minutes)	**Session 7**	
	S7-A (SMC-086) TRACK: Machine Learning – Resistance/Seakeeping **Accelerations and Added-resistance Predictions Using Machine Learning for Planing Hulls** **Speaker: TBD** While vertical motions and added resistance in displacement ships can generally be predicted following a linearity assumption using the RAO method, high-speed vessels operating in irregular waves exhibit nonlinear seakeeping behavior that requires alternative semi-empirical predictive approaches at early design phases. These nonlinearities stem from vessel geometry, speed and wave spectrum characteristics. This study predicts of vertical acceleration statistics and average added resistance of planing hulls in a seaway using five machine learning methods, including neural networks. The dataset includes experimental series in irregular waves conducted by Fridsma, extended cases from Brown, and further expansions of Zarnick and Turner. These data-driven models outperform traditional empirical methods, such as those by Savitsky and Brown, particularly under high-speed conditions where nonlinear effects dominate. Machine learning emerges as a robust tool for preliminary design assessments, offering enhanced prediction capability.	Momentum Room
	S7-B (SMC-030) TRACK: Auxiliary Systems **Testing Methodology for Seat Suspension Units in High-Speed Planing Craft** **Speaker: TBD** High-speed planing craft, such as rigid hull inflatable boats (RHIBs), are frequently subjected to severe hydrodynamic impacts during operation, particularly in rough sea conditions. These impacts pose significant risks to the comfort, health, and performance of the crew. Resilient seat suspension units (SSUs) are designed to mitigate these impacts, but their effectiveness is challenging to assess under real-world conditions due to the potential hazards to the crew and variability of sea trials. This paper outlines a methodology for replicating slamming events experienced by high-speed craft in a controlled environment. By using drop tests of a pontoon and characterizing the dynamic environment with the Shock Response Spectrum (SRS), this study enables standardized testing of SSUs without the need for repeated live sea trials to evaluate and compare different seat designs.	Fusion Room
2:30 PM – 3:00 PM (30 Minutes)	**Session 8**	
	S8-A (SMC-020) TRACK: Structures **Hull Structure Monitoring on a Fleet of High-Speed Patrol Boats - Data to Decisions** **Speaker: TBD** Accurate prediction of hydrodynamic loading on high-speed patrol vessels is critical for structural integrity and fatigue life assessment yet remains a complex challenge. To mitigate this, the U.S. Coast Guard employs Hull Structure Monitoring Systems (HSMS) on its Sentinel Class Fast Response Cutters (FRC). Data from over 60 vessels, in service since 2010, informs design improvements and sustainment strategies. This full-scale monitoring, coupled with analytical modeling and trial data, supports the development of a structural Digital Twin. Analysis focuses on fatigue life factors, with the goal of optimizing fleet maintenance and reducing Total Ownership Costs.	Momentum Room
	S8-B (SMC-071) TRACK: Machine Learning - Seakeeping **Bayesian Hankel Extended Dynamic Mode Decomposition for System Identification of High-Speed Planing Hulls**	Fusion Room

TIME	PROGRAM	Location
	Speaker: TBD This study explores Bayesian Hankel extended Dynamic Mode Decomposition with control (BHeDMDc) as data-driven, model-free methods for predicting the response of the Generic Prismatic Planing Hull (GPPH) in wave conditions. This approach decomposes complex vessel dynamics into spatial-temporal coherent modes, incorporates time-delay embeddings and extended observables for improved robustness to transient and nonlinear effects, integrates control inputs to enhance predictive accuracy, and includes probabilistic uncertainty quantification. The method is applied to towed motion in irregular head waves. Performance metrics include motion variables and forces reconstruction. Analysis shows that BHeDMDc effectively captures dominant dynamic features with real-time predictive capability essential for digital twin applications. The method is capable of addressing the direct problem, predicting motions from wave signals, and the inverse problem, predicting forces acting on the hull from motion variables easily measurable on board. This research highlights the strengths of the method and supports the development of uncertainty-aware, data-driven models for high-speed naval vessels, with potential extensions toward real-time adaptation and validation using experimental data.	
3:00 PM – 3:30 PM	**BREAK**	Foyer
3:35 PM – 4:05 PM (30 Minutes)	**Session 9**	
	S9-A (SMC-050) TRACK: Stability/Maneuverability **Computational Study of Dynamic Instability for High-Speed Planing Hull Maneuvers in Calm Water** **Speaker: TBD** This study investigates dynamic instabilities during turning maneuvers of a high-speed planing hull using computational simulations, including turning circles, quick turn, and avoidance line tests. A Generic Prismatic Planing Hull (GPPH) model is used for the simulations. Relevant performance criteria and dynamic instabilities reported in the literature are summarized and applied to assess the turning maneuvers of the GPPH. Turning circles are analyzed based on circular motion equations and force and moment balances. Instabilities are identified through animation analysis and time histories of motion and acceleration quantities. The maneuvering ship speed is determined in the quick-turn tests, while the performance in the avoidance line test is evaluated under various settings.	Momentum Room
4:10 PM – 4:40 PM (30 Minutes)	**Session 10**	
	S10-A (SMC-013) TRACK: Machine Learning **Data-Driven System Identification of High-Speed Craft Dynamics - Uncovering Governing Equations with Machine Learning** **Speakers: Subodh Chander & Stefano Brizzolara** The dynamics of high-speed craft operating in the marine environment are characterized by interactions between hydrodynamic, aerodynamic, and inertia forces. This results in a highly nonlinear coupled dynamic motion in head seas heave and pitch. The traditional approach for system identification often relies on first principles approximate hydrodynamic methods or high-fidelity Computational Fluid Dynamics (CFD). CFD methods are effective, but computationally expensive, particularly during the iterative design process, or real time applications. To overcome such limitations, in this study we are investigating the feasibility of system identification methods, using Sparse Identification of Non-Linear Dynamics (SINDy) algorithm for the system identification of the dynamics of high- speed crafts. SINDy is a data-driven approach that identifies sparse governing equations directly from motion data, which offers a computationally efficient framework for reduce order modelling of complex system.	Momentum Room
4:50 PM – 5:00 PM (10 Minutes)	**Closing Remarks**	Momentum Room
5:00 PM – 7:00 PM	**Reception / Social**	Foyer

SMC PROGRAM 2025

Thursday, October 30, 2025

TIME	PROGRAM	Location
7:00 AM – 7:00 PM	Registration OPEN	3rd Fl. Foyer
7:30 AM – 10:00 AM	**Breakfast & Panel**	Granby Ballroom
7:45 AM – 8:00 AM (15 Minutes)	**Welcome Remarks**	
8:00 AM – 10:00 AM (120 Minutes)	**PANEL Session 1** **Rebuilding America's Shipbuilding Power – A Call to Action** **Speakers: Dan Sfiligoi (NASSCO)** Moderator: Morgan Fanberg (Glosten) The U.S. shipbuilding industry is at a crossroads. For decades, we've watched as our shipyards aged, our workforce declined, and our reliance on foreign-built vessels increased. Now, with growing national attention, including the administration's commitment to appoint a White House position to lead shipbuilding, we have a rare opportunity to reverse this trend. This panel will bring together industry leaders, policymakers, and maritime experts to tackle the critical issues facing U.S. shipbuilding today: • Modernizing our shipyards to compete with the world's best. • Incentivizing vessel construction to revitalize our fleet. • Ending reliance on aging vessels by reforming USCG certification policies. • Protecting America's naval architecture expertise and strengthening our domestic design capabilities. • Expanding our workforce pipeline by promoting shipbuilding trades in high schools and training programs as a viable alternative to universities. • Ensuring our national security by maintaining a viable commercial shipbuilding sector that supports our military readiness. This discussion will not only define what needs to be done, it will push for real, actionable solutions to ensure America remains a global maritime leader.	
10:00 AM – 5:30 PM	**Exhibit Hall Open**	MAIN A, D&E & Foyer
	TECHNICAL SESSION 1	
10:10 AM – 11:00 AM (50 Minutes)	**Tech Session 1A** (SMC-072) TRACK: Operations **A Decade of Lessons from the World's First All-Electric Ferry** **Speaker: Andrew Orvieto** Moderator: TBD The world's first fully electric passenger ferry, the MV Ampere, recently celebrated 10 years in operation. Originally envisioned as a proof of concept by the Norwegian Road Authority (Statens Vegvesen) (the vessel ultimately paved the way for the electrification of the Norwegian ferry infrastructure. As of 2024, there are 90 electric and hybrid ferries in operation along the Norwegian coast and fjords. The MV Ampere also served as a powerful example of technology and collaboration that has helped drive the proliferation of electric ferries around the world. So how did this vessel come to be, and what are some of the key lessons learned from its first decade of operation?	MAIN BC
	Tech Session 1B (SMC-007) TRACK: Operations **US Short Sea Shipping and GHG Reduction** **Speaker: John Daidola** Moderator: TBD Opportunities for GHG reduction with Short Sea Shipping (SSS) in the US are investigated for their potential impact on US transportation emissions and how they compare to those being addressed by IMO for international shipping. There is a decades long body of support for increasing SSS in the US which has been concerned predominantly with alleviating landside traffic congestion. Europe as well has had a historical adoption of SSS as a component of its transportation system and more recently has considered its contribution to Greenhouse Gases (GHGs). Cars and trucks comprise the largest component of the US Transportation Sector which is the largest responsible for GHG production, while	MAIN FGH

TIME	PROGRAM	Location
	also contributing to roadway congestion and damage affording opportunity for improvement. Although benefits of SSS in the US have been acknowledged progress in its development has been slow. Current SSS systems are considered and their expanded use postulated for evaluating the effects they could have on GHG emissions, and as a by-product congestion and road damage. Federal and state support such as that enjoyed by other transportation systems is addressed as a potential catalyst to support SSS. More vessels to serve SSS will also benefit the US shipbuilding industry, Nevertheless projections of future road traffic suggest there may be no alternative to substantially increasing SSS.	
	Tech Session 1C (SMC-026) TRACK: Design **Net Drag Reduction in High Block Coefficient Ships and Vehicles Using Vortex Generators** **Speaker: TBD** Moderator: TBD We document experimentally at model scale, net viscous drag reduction of at least 7.5% in streamlined hulls with high block coefficient, applicable to bulk carriers and tankers, using wedge shaped vortex generators (VGs). We also establish scaling laws proving that at full-scale drag reduction is fully preserved, and estimate the size and cost of VG installation and the gains that can be materialized in ship operations.	PDF Center
11:00 AM – 11:30 AM	**Break / Visit Exhibits**	MAIN & Foyer
11:30 AM – 1:20 PM (110 Minutes)	**PANEL Session 2** **Navigating the Cold Frontier: The Future of Icebreaker Design and Construction in North America** **Speakers: TBD** Moderator: Laurie Balen (Genoa Design) Icebreakers play a critical role in ensuring safe maritime navigation, supporting economic activity, advancing scientific exploration and protecting sovereignty. From the Arctic shipping lanes to the Great Lakes, the demand for modern, efficient, and environmentally sustainable icebreakers is growing. This panel discussion brings together five experts to explore the challenges, innovations, and strategic importance of building icebreakers in North America for North America. Topics include technological advancements, funding and policy considerations, and the geopolitical significance of maintaining icebreaking capabilities in a warming yet still frozen frontier. Attendees will gain insights into how North America can strengthen its maritime infrastructure and adapt to evolving regional needs. ***Sponsored by: VARD Marine***	MAIN FGH
	TECHNICAL SESSION 2	
11:30 AM – 12:20 PM (50 Minutes)	**Tech Session 2A** (SMC-043) TRACK: Design **Payback Beware: A Valuable Antique or an Old Remnant in the Decarb Era?** **Speaker: John Hatley** Moderator: TBD For decades the maritime field has relied upon Payback as the initial litmus test for determining the economic viability of an investment to improve performance. This document describes the shortcomings of Payback in the environmental era and why it should be discarded in favor of traditional Free Cash Flow.	MAIN BC
	Tech Session 2B (SMC-011) TRACK: Operations **Utilizing AI to Build "Failure Data and Predictions Models" for Ship Construction and Sustainment Support** **Speakers: Mark Debbink & Subrat Nanda** Moderator: TBD This presentation provides technology transfer for an extensive NSRP RA project; from the ABS & HII team, which utilized AI capabilities to mine ship maintenance and repair databases to provide historic performance information to improve ship availability planning. The project created the capability to provide ship class specific failure data readiness/quality assessment reports and develop a roadmap for government fleet owner/operators and shipyards to (1) optimization yard availabilities, and (2) provide feedback to follow-on vessels using advanced data analytics from available operational ship conditions. The team developed and demonstrated guidance on building useful failure and ship condition data sets for use with advanced data analytics methods/tools; Artificial	PDF Center

TIME	PROGRAM	Location
	Intelligence (AI), to support key decisions related to ship sustainment (especially yard availability planning) and new construction of future ships. The work focused on the critical systems that contribute to the biggest issues for government fleet owner/operators and the yards that build and support these fleets. Realized benefits to Industry and Navy are to 1) reduce the cost and improve the predictability of scheduling for yard availability periods for ships, and 2) eliminate recurring failures within a vessel class by addressing critical system issues during new construction of subsequent ships. These capabilities provide significant savings for government owner/operators and shipyards while also improving mission availability.	
	TECHNICAL SESSION 3	
12:30 PM – 1:20 PM (50 Minutes)	**Tech Session 3A** (SMC-045) TRACK: Operations **Risk Mitigation of Emerging Technologies – Autonomous Operations** **Speaker: Timothy Haymaker** Moderator: Suzanne Beckstoffer The goal of this project is to identify and mitigate the risks of introducing autonomous operations to the maritime community. Identified risks include mariner acceptance, safety, regulation, insurance and liability, lack of software commonality and standards, knowledge and training. These risks must be addressed through open and continued communication and continuing education. Fostering the integration of autonomous operations into the maritime community will require class and safety identification from recognized and trusted organizations like ABS, ISM/IMO, MARAD, and the U.S. Coast Guard, along with detailed safety, regulatory, insurance, and liability practices, which will need to be enacted. Autonomous operations, whether smart, semi-autonomous, or fully autonomous, are here to stay and heading toward tomorrow at full speed. Both civilian and military programs are currently funded and in full R&D swing, with some countries practicing autonomous operations in their waters today!	MAIN BC
	Tech Session 3B (SMC-046) TRACK: Design **Wind Propulsion and Multi-Stage Performance Optimization of Flettner Rotors for a Cargo Vessel** **Speaker: TBD** Moderator: TBD Wind-assisted propulsion is a key solution for reducing maritime emissions, offering a cost-effective alternative to fully emission-free technologies. However, integrating wind propulsion into holistic ship design remains limited. This paper presents a parametric approach using Computational Fluid Dynamics (CFD) and topology modelling to optimize Flettner Rotor configurations on various ship types. An inviscid Eulerian flow method reduces computational costs while maintaining acceptable prediction accuracy for the considered early design stage. The study validates results against high-fidelity simulations and wind tunnel tests. Using HSVA's "EcoLibrium" tool, performance predictions and optimization loops enhance vessel's efficiency. The optimized design will undergo towing tank testing for further validation.	PDF Center
12:30 PM – 2:00 PM	**Student/Industry Round Table** Moderator:	Granby Ballroom
1:15 PM – 2:30 PM	**Lunch / Visit Exhibits**	MAIN & Foyer
	TECHNICAL SESSION 4	
2:30 PM – 3:20 PM (50 Minutes)	**Tech Session 4A** (SMC-057) TRACK: Production **Optimized Structural Design Recommender System** **Speaker: TBD** Moderator: TBD The implementation of optimized structural design recommender systems utilizing Artificial Intelligence (AI) offers unprecedented opportunities for enhancing the economic viability of vessels. By representing complex ship structural design data as a graph, one can leverage the unique characteristics of Graph Neural Networks (GNNs) to propose design solutions to naval architects during the basic design process. This approach enables the generation of designs in a reduced time frame while facilitating the immediate identification and investigation of potential errors, thereby impacting the ship's cost, performance, weight, stability, safety, and manufacturability.	MAIN BC
	Tech Session 4B (SMC-012) TRACK: Operations **Selecting Risk Analysis Methodologies for Maritime Application**	MAIN FGH

TIME	PROGRAM	Location
	Speakers: Jade Penny & Vincent Paglioni Moderator: TBD Regulatory bodies and class associations recommend risk analysis methodologies with minimal guidance. This assessment clarifies which recommended methodologies suit which circumstances and the shortfalls of each through literary review. Methodologies were checked for suitability based on stage in system lifecycle, feasibility of use, current industry applications, and breadth of review. Mapping methodologies to specific applications directs the end user on a focused path, which was tested against historical maritime casualties. The improved user interface promotes a proactive approach to risk analysis, which helps prevent major casualties from occurring, better protecting our seafarers. Because people are integral to any maritime system lifecycle, research found inclusion of human risk factors was critical for whole system risk assessment. The findings recommend further investigation of human risk analysis methodologies utilized in other industries. The environment where the risk analysis technique was executed throttled the allowable level of complexity. Several circumstances, such as shipboard ad-hoc assessments, require satisficing to fit within the situation's natural boundaries like time and available computing power. Alternatively, design phases and long-term planning can engage more robust risk analysis methodologies.	
	Tech Session 4C (SMC-082) TRACK: Design **Assessment of Wave-Induced Loads on a Ship: A RANS-Based Method** **Speakers: Frederico Franciosa & Stefano Brizzolara** Moderator: TBD Maritime accidents, though rare, can cause severe damage, underscoring the need for accurate wave-load prediction tools. This study uses a RANS-based approach to estimate ship motions and loads in regular waves, covering wavelengths from 0.31 Lpp to 1.86 Lpp. Response Amplitude Operators are computed and compared with experimental data from the TUB towing tank. A sensitivity analysis is conducted to assess the influence of grid resolution, domain size, and time-step selection on simulation reliability, supporting the method's effectiveness for seakeeping and wave-load prediction.	PDF Center
	TECHNICAL SESSION 5	
3:30 PM – 4:20 PM (50 Minutes)	**Tech Session 5A** (SMC-021) TRACK: Design **Case Study: Vessel Designs With Reduced Underwater Noise** **Speaker: Jesse Spence** Moderator: Rick Ashcroft Regulatory bodies and class associations recommend risk analysis methodologies with minimal guidance. This assessment clarifies which recommended methodologies suit which circumstances and the shortfalls of each through literary review. Methodologies were checked for suitability based on stage in system lifecycle, feasibility of use, current industry applications, and breadth of review. Mapping methodologies to specific applications directs the end user on a focused path, which was tested against historical maritime casualties. The improved user interface promotes a proactive approach to risk analysis, which helps prevent major casualties from occurring, better protecting our seafarers. Because people are integral to any maritime system lifecycle, research found inclusion of human risk factors was critical for whole system risk assessment. The findings recommend further investigation of human risk analysis methodologies utilized in other industries. The environment where the risk analysis technique was executed throttled the allowable level of complexity. Several circumstances, such as shipboard ad-hoc assessments, require satisficing to fit within the situation's natural boundaries like time and available computing power. Alternatively, design phases and long-term planning can engage more robust risk analysis methodologies.	MAIN BC
	Tech Session 5B (SMC-041) TRACK: Production **Land Based Test Site for Testing Electronic Systems** **Speakers: Luke Staff** & Matt Gillmore Moderator: TBD Electronic System Integration (ESI) in government build contracts faces the dual challenge of incorporating the latest technology while confirming design details early in the process with minimal changes. For shipyards, the primary focus is on reducing the risk of design changes or rework during production. Confirming installation details during the design phase for first-of-class vessels provides early risk reduction by allowing hands-on verification of foundation requirements, cable terminations, and electronic interface details. An ESI team was established	MAIN FGH

TIME	PROGRAM	Location
	that translates government specifications into procurement specifications for each system, conducts Factory Acceptance Testing (FAT) on this equipment, and bring it to the LBTS to test the interfaces between systems. This process also confirms the physical details of the equipment which reduces amount of rework needed during the build phase.	
	Tech Session 5C (SMC-049) TRACK: Operations **Digital Healthcare Engineering System for Enhancing the Safety and Sustainability of Aging Monopile Offshore Wind Turbines in Storm Conditions** **Speakers: Abdulaziz Sindi & Jeom Paik** Moderator: TBD Offshore wind turbines using monopile foundations dominate shallow water installations but face increasing structural degradation as they age. Cumulative damage such as corrosion, fatigue cracking, and denting exacerbated by worsening metocean conditions poses serious risks to safety and performance. Existing maintenance strategies often fall short, especially during storms. This study introduces a Digital Healthcare Engineering (DHE) system that integrates high-fidelity numerical models, environmental data, and Artificial Intelligence (AI) to assess and predict structural health in real time. The system shifts infrastructure management from reactive to proactive, improving failure detection and maintenance planning. It also offers a scalable solution for aging offshore and marine assets.	PDF Center
4:20 PM – 4:40 PM	**Break / Visit Exhibits** ***Sponsored by:***	MAIN & Foyer
	TECHNICAL SESSION 6	
4:40 PM – 5:30 PM (50 Minutes)	**Tech Session 6A** (SMC-110) TRACK: Production **Accelerating Shipyard Modernization: A Technology Transfer and Insertion Framework** **Speakers: Jessica Galassie & Christopher Lynch** Moderator: TBD This paper presents a framework for accelerating shipyard modernization by integrating Extended and Virtual Reality (XR/VR) technologies into drydock training. Leveraging SBIR/STTR technologies and powered by Agentic AI, the proposed system translates deckplate issues into Navy Quad Charts, maps them to relevant innovations, and prioritizes solutions using a risk-based dashboard. Key AR/VR applications include maintenance, docking/undocking, and emergency response training. The framework enhances communication, reduces risk, and supports informed technology adoption decisions. This effort aligns with global technology transfer themes by modernizing shipyard processes and improving workforce readiness through structured digital tools and immersive training strategies.	MAIN BC
	Tech Session 6B (SMC-085) TRACK: Design **Reliability Journey: FTA Tool for Zero-Carbon Fueled Ships** **Speakers: Suzy Jiang, Quaim Choudhury & Onur Semiz** Moderator: TBD Driven by energy transition in the maritime industry, alternative fuels are considered one of the main energy solutions to meeting the demand forecast and achieving Greenhouse Gas (GHG) goals set by the International Maritime Organization (IMO). Zero/low-carbon fuels include methanol, ammonia, bio-fuel, hydrogen, etc. However, in contrast to traditional fuels, alternative fuels contain highly flammable (e.g. methanol) or toxic (e.g., ammonia) chemicals, posing safety concerns that need to be addressed in a structured manner. This paper presents several case studies using a fault tree analysis tool to improve the safety of zero-carbon fueled ships.	MAIN FGH
	Tech Session 6C (SMC-055) TRACK: Operations **Port-LCA: A Real Time LCA Framework for Vessel Emissions in Ports** **Speakers: Ioannis Chalaris** & Byongug Jeong Moderator: TBD This study introduces Port-LCA, an innovative Life Cycle Assessment approach aimed at quantifying Well-to-Wake (WTW) greenhouse gas emissions from vessels when they are inside port limits. In contrast to traditional inventory approaches, Port-LCA incorporates AIS-based vessel monitoring, operating phase segmentation, engine-specific modeling, and distinct fuel route data to provide precise, real-time emissions estimates of vessels inside specific port	PDF Center

TIME	PROGRAM	Location
	boundaries. A hypothetical case study with a bulk carrier (MDO), a tanker (LNG), and a container vessel (green methanol) demonstrates the methodology's capacity to quantify emissions by phase, vessel type, and fuel strategy. The results underscore the relevance of auxiliary engine emissions during berthing and anchoring, as well as the necessity of considering upstream fuel production implications. Port-LCA provides pragmatic insights for ports and authorities aiming for data-driven decarbonization. Future endeavors will encompass model validation utilizing operational information and incorporation into pollution monitoring and regulatory frameworks.	
5:30 PM – 6:00 PM	Free Time	
6:00 PM – 7:00 PM	**GALA Reception**	Granby Foyer
7:00 PM – 7:30 PM	Banquet Seating	Close Foyer Bar
7:30 PM – 10:00 PM	**Awards GALA** ***Students Sponsored by: BSR & Associates***	Granby Ballroom

Friday, October 31, 2025

TIME	PROGRAM	Location
7:00 AM – 5:00 PM	Registration OPEN	3rd Fl. Foyer
7:30 AM – 8:45 AM (75 Minutes)	**Breakfast & Panel** **PANEL Session 3** **IPDE With PLM Revolutionizing Naval Shipbuilding** **Speakers: Timothy Nichols** Moderator: Nick Guertin An Integrated Product Development Environment (IPDE) with Product Lifecycle Management (PLM) software has emerged as the most significant breakthrough in naval shipbuilding in recent years. An IPDE creates a cohesive and synchronized enterprise among all shipyard functions and operations and provides everyone immediate access to the "single source of truth" a 3-D digital model of all systems, structures, and arrangements with supporting technical artifacts, e.g., CFD, FEA, etc. results. The PLM suite manages workflows among all stakeholders and manages program changes, design changes, configuration changes, and BoM updates. The PLM system also can generate daily work instructions with 3-D models, training videos and related supporting information to improve the effectiveness and efficiency of shipyard workers. The panel members will share their views on the crucial features of an IPDE with PLM and how these features impact traditional shipyard processes.	Granby Ballroom
9:00 AM – 10:00 AM (60 Minutes)	**SNAME Business Session**	
9:00 AM – 2:00 PM	**Exhibit Hall Open**	MAIN & Foyer
10:00 AM – 11:00 AM	Student Job Fair Set-up	Granby Foyer
	TECHNICAL SESSION 7	
10:00 AM – 10:50 AM (50 Minutes)	**Tech Session 7A** (SMC-097) TRACK: Design **Accelerating Heavy Lift and Transport Design and Analysis for the Polar Icebreaker** **Speaker: TBD** Moderator: TBD This paper presents the development and review of shipyard heavy lift and transport design and analysis at Seaspan Vancouver Shipyard, located in the Canadian Pacific. With larger projects that require higher demands in movement in the yards, several challenges arose, such as design, process, and physical constraints. The state of design and analysis of rigging and structural analysis is discussed and compared to industry methods. Seaspan has updated its design and analysis process to create safe and efficient production operations. Case studies of common analysis techniques and notes are also discussed.	MAIN BC
	Tech Session 7B (SMC-053) TRACK: Operations **USCG Product Lifecycle Management System Data Requirements Interface Mapping**	MAIN FGH

TIME	PROGRAM	Location
	Speaker: TBD Moderator: TBD The US Coast Guard (USCG) needs to transition from paper-based documentation to digital support of maintenance, repair, and overhaul (MRO) activity for their fleet. The transition to digital MRO support is expected to provide significant cost avoidance for USCG engineering and maintenance personnel. The US Navy has made progress in their transition efforts, but their digital MRO support requirements and resultant solutions are unlikely to be fully responsive to USCG priorities. A tailored approach that meets USCG requirements will yield optimal results. This paper describes a National Shipbuilding Research Program effort that is reviewing sustainment data requirements for the USCG that can be harvested from the 3D Product Build Model. Additional data required for the USCG product lifecycle management (PLM) product are being determined and then mapped through an interface between the respective PLM products. The paper also describes the required software connectors between the new construction Product Build Model, the new construction yard's PLM, and the USCG PLM for future fleet MRO availabilities.	
	Tech Session 7C (SMC-065) TRACK: Design **Comparison of Slamming Force Calculations for a Semi-Displacement Vessel** **Speakers: Ahmed Ibrahim, Kenneth Weems** & Carolyn Judge Moderator: TBD Growing interest in midsize semi-displacement vessels for crewed or autonomous operations necessitates accurate slamming/whipping load prediction—key design drivers for larger, faster vessels. While hydro-elastic experiment and Computational Fluid Dynamics (CFD) are often cost-prohibitive, potential flow codes offer a quicker alternative. However, their reliability is hampered by a lack of validation against comprehensive hydro-elastic model test data. Addressing this gap, the US Naval Academy performed hydro-elastic experiment on a 154-ft vessel. This paper presents a qualitative comparison of experimental data with simulations from the Large Amplitude Motion Program (LAMP). The comparison focuses on all four impact force calculation methods within LAMP, aiming to enhance predictive accuracy for these critical loads.	PDF Center
10:50 AM – 11:30 AM	**Break/Visit Exhibits**	MAIN & Foyer
11:00 AM – 1:00 PM	**Maritime Job Fair**	Granby Foyer
	Interview Rooms	XCH 1, 2 & 3
11:30 AM – 1:20 PM (110 Minutes)	**PANEL Session 4** Reliability Journey for Technology and Energy Transition Speakers: TBD Moderator: Dr. Suzy Jiang (ABS) This panel provides a platform for experts in the new technology/energy transition and Reliability, Availability, Maintainability and Safety (RAMS) focus areas to collaborate in bringing the major challenges in the identified fields and presenting potential solutions. The panel consists of four subject matter experts (SMEs) in the energy transition/new technology and RAMS in the maritime industry.	Granby Ballroom
	TECHNICAL SESSION 8	
11:30 AM – 12:20 PM (50 Minutes)	**Tech Session 8A** (SMC-016) TRACK: Operations **Quantitative Mitigation of URN in Harbour Tug Design and Operation** **Speakers: Waltfred Lee, Giorgio Burella & Vince Den Hertog** Moderator: TBD The mitigation of underwater radiated noise (URN) from anthropogenic sources has been recognized as vital for preserving marine ecosystems. This topic has sparked interest in the larger shipping industry from various stakeholders, including government, regulatory bodies, owners, ports and shipbuilders. In particular, URN has a great impact on marine fauna near harbors where shipping activities dominate the underwater soundscape. In the Salish Sea, in southern British Columbia, the population of the Southern Resident Killer Whales has been particularly impacted by years of increasing shipping noise in their natural habitats. Harbor and escort tugs contribute to the URN emissions in and around ports, both in British Columbia and worldwide. These high-performance vessels generate substantial noise during harbor and escort operations, which comprise a varied operational profile. Characterization of noise generated by tugs—across various operational conditions and tug types with different propulsion systems—	MAIN BC

TIME	PROGRAM	Location
	is a novel area of research which is not largely documented. The systematic collection of URN data on tugs enhances our understanding of their noise signatures and enables ship designers to address and mitigate URN issues at the design stage, tackling the problem at its source.	
	Tech Session 8B (SMC-080) TRACK: Design **Comparative Design Study of a Polar Research Icebreaking Vessel** **Speaker: TBD** Moderator: TBD The rise in global temperatures has opened new routes for marine traffic in previously frozen polar regions, increasing demand for ice-capable vessels to support research and exploration. This has led to a push for more energy-efficient icebreakers with reduced emissions. Growing interest has also introduced the 3-pod configuration, which has yet to be fully explored. Our research aims to determine the most effective azimuth thruster configuration for an open ocean-going icebreaker by comparing 2-pod and 3-pod designs. Both vessels were designed similarly, with identical hulls from midships aft and above the waterline, differing only in pod size. The primary difference was the bow design: the 2-pod vessel has a conventional icebreaking bow, while the 3-pod vessel features a forward, centerline pod. To isolate the impact of the pod configuration, both vessels share the same power generation, superstructures, and internal structures.	MAIN FGH
	Tech Session 8C (SMC-090) TRACK: Operations **SRtP Regulations: Application to a Ro-Ro Ferry Serving Southwest Alaska** **Speakers: Michael Freeman, Witt Shae & Colin Flynn** Moderator: TBD This paper discusses the design of a 330' (100m) Ro-Ro Ferry in accordance with SOLAS and classification society Safe Return to Port (SRtP) regulations while also meeting the operational challenges of serving small remote communities in South Central and Southwest Alaska. The design poses a number of challenges, and the SRtP regulations provide a framework for increasing the safety and reliability of this type of vessel. SRtP regulations necessitate detailed redundancy and segregation design of propulsion, steering, auxiliary machinery, habitability, navigation, control, and communication systems such that the vessel is operable following afire or flooding casualty event. Outlined herein is a discussion of the design process and particular technical decisions, from concept and general design basis development to details of system engineering and compliance assessment.	PDF Center
	TECHNICAL SESSION 9	
12:30 PM – 1:20 PM (50 Minutes)	**Tech Session 9A** (SMC-042) TRACK: Design **SNAME SD-6 Icebreaker Design Panel Paper Status** **Speakers: George Sidney & Panel Members** Moderator: TBD This session will provide an update on the status of T&R Panel SD-6 Icebreaker Design covering the following topics: • Icebreaker Power and Propulsion Parametric Initial Design Standards • Optimizing Arctic Ship Repair Service: A Leagile Digital Transformation Approach for Ensure nonstop operation • Optimizing Plate Straking for Ice-Breaking Vessels Constructed via Cold Forming	MAIN BC
	Tech Session 9B (SMC-034) TRACK: Design **An Integral 1D Ship Propulsion Model for Fuel Efficiency** **Speaker: TBD** Moderator: TBD To address GHG reduction goals, this study develops an integral 1D model combining engine, propeller, and hull resistance to optimize fuel efficiency through operational management. Validated against onboard measurements, the model demonstrated its capability to accurately predict the main engine's performance without requiring detailed combustion data. It examines engine response under fuel rack limiter constraints and identifies optimal engine speeds for varying sea conditions. A case study on a Panamax bulk carrier demonstrated that, operational optimization using this model can significantly contribute to improving fuel efficiency. The model enables practical, real-time simulation and offers insights for enhancing propulsion performance under real-sea environments.	MAIN FGH

TIME	PROGRAM	Location
	Tech Session 9C (SMC-025) TRACK: Operations **Virtual Testing Framework for Verification and Validation of the Autonomous Navigation Function in Marine Vessels** **Speaker: TBD** Moderator: TBD As maritime autonomous navigation technologies develop, traditional documentation-based or physical test-driven verification and validation (V&V) methods are inadequate to capture the wide variety of real-world operational scenarios due to the substantial costs, logistical complexity and inherent safety concerns of field testing. To address this issue, this work presents a modular, high-fidelity virtual simulation framework designed to support the V&V of autonomous marine navigation functions. The framework integrates dynamic models of marine vessels, sensors, neighboring vessels, and autonomous navigation algorithms along with performance indicators to verify and validate specifications of autonomous navigation functions in various marine navigation scenarios which are necessary for regulatory approval and certification compliance.	PDF Center
1:20 PM – 2:30 PM	**Lunch/Visit Exhibits**	Main & Foyer
2:30 PM - 6:00 PM	Exhibit Hall Tear-Down	MAIN & Foyer
2:30 PM – 4:20 PM (110 Minutes)	**PANEL Session 5** **Nuclear Power for Commercial Vessels: Feasibility, Challenges, and the Path Forward** **Speakers: Mikal Boe (CORE Power)** Moderator: TBD The maritime industry faces mounting pressure to decarbonize, and nuclear power has re-emerged as a viable long-term solution. With advancements in small modular reactors (SMRs), floating nuclear power plants (FNPPs), and evolving regulatory frameworks, nuclear propulsion for commercial vessels is becoming a serious consideration. However, challenges remain—public perception, regulatory hurdles, financing, and operational integration. This panel brings together experts from naval architecture, reactor technology, policy, and ship operations to discuss the feasibility of nuclear-powered commercial vessels, key technological and regulatory considerations, and the necessary steps to make nuclear propulsion a reality.	Granby Ballroom
	TECHNICAL SESSION 10	
2:30 PM – 3:20 PM (50 Minutes)	**Tech Session 10A** (SMC-044) TRACK: Operations **Time Step Analysis of a Crash Stop Maneuver for Ferries** **Speakers: Alex Koziol IV & Benjamin Hunt** Moderator: TBD Rapid stopping capability is a critical safety feature for ferries operating in confined waterways. Otherwise known as the crash stop, this maneuver is a well-studied character of maneuverability for large oceangoing vessels, in particular with regards to the ability of a large tanker to stop in the event of an impending collision or allision. However, crash stop performance is difficult to characterize for smaller, higher-powered vessels such as ferries with propulsion machinery that allow rapid reversal of shaftlines. In addition, the influence of propeller geometry on crash stop performance is poorly quantified. This paper proposes a simulation method using four quadrant data to evaluate crash stop performance. Two notional case study vessels are introduced and used to develop insights on the influence of propeller design parameters on crash stop performance. This approach demonstrates how large-scale simulation can convert scattered design intuition into quantitative guidance for safer and more efficient operations.	MAIN BC
	Tech Session 10B (SMC-084) TRACK: Operations **DiEM – A Digital Engine Management Platform for Condition-Based Maintenance and Performance Optimization** **Speaker: TBD** Moderator: TBD The LNG shipping industry faces mounting pressures from decarbonization regulations, supply chain disruptions, and increasing engine complexity. To address these challenges, Propulsion Analytics and GasLog co-developed Digital Engine Management (DiEM) platform an Engine Condition-Based Maintenance (ECBM) scheme hosted on the. DiEM integrates high-frequency engine data, physical inspections, lubricant and water analyses with physics-	MAIN FGH

TIME	PROGRAM	Location
	based digital twin modeling and machine learning to assess engine health, predict faults, and optimize maintenance. This paper outlines the ECBM framework, detailing its data acquisition, diagnostic methodologies, and integration with maintenance systems.	
	Tech Session 10C (SMC-023) TRACK: Production **Lignum Vitae: Eliminating Risk of PFAS From Water Lubricated Bearings** **Speakers:** Daniel Westerbaan, Dean Breton & Marty Sdao Moderator: TBD This study evaluates the environmental and performance impacts of materials used in water-lubricated marine bearings. Historically made from lignum vitae, these bearings shifted to synthetic alternatives due to overharvesting. However, many synthetic materials release harmful PFAS, which persist in water and pose ecological risks. Testing showed lignum vitae contains no PFAS, while synthetics exceeded safe fluorine levels by up to 1000 times. Modern marine trends—larger propellers and slower shaft speeds—worsen wear and PFAS release due to thinner lubrication films. Under these conditions, lignum vitae outperformed synthetic materials, exhibiting lower friction and wear. With sustainable harvesting practices now in place, lignum vitae is again a viable, eco-friendly option. The study recommends further PFAS analysis, and full-scale lignum vitae trials to reduce the marine industry's environmental footprint.	PDF Center
	TECHNICAL SESSION 11	
3:30 PM – 4:20 PM (50 Minutes)	**Tech Session 11A** (SMC-038) TRACK: Operations **Viability and Impacts of Low-Carbon Fuels for Maritime Applications** **Speaker: TBD** Moderator: TBD This study evaluates the lifecycle viability of ammonia, hydrogen, methanol, and Fischer–Tropsch diesel as low-carbon fuels for maritime shipping by integrating regional supply chain modeling with the NavigaTE global fleet model. Using this framework, we consider scenarios involving widespread adoption of single alternative fuels and production pathways to illustrate the big-picture advantages and disadvantages of each in the context of the global maritime industry. Production pathways that use renewable electrolytic or biogenic hydrogen offer the most favorable trade-offs between costs and emissions in most regions, achieving up to 90% and 80% reductions in well-to-wake emissions relative to low-sulfur fuel oil, respectively. However, each comes with substantial feedstock constraints. Electrolytic fuels require up to 6,800 TWh/year of electricity, equivalent to 23% of current global generation. Biogenic routes demand up to 1.6 Gt of lignocellulosic biomass, exceeding estimated sustainable availability from forestry residues. Blue hydrogen pathways that pair methane reforming with carbon capture and storage can reduce emissions below LSFO levels if sequestration is permanent but require up to 24% of global natural gas supply and come at higher cost than electrolytic and biogenic options in many regions. Methanol and FT diesel production also necessitate large CO_2 inputs – up to 580 Mt and 1,300 Mt, respectively, which would require a major scale-up of carbon capture and utilization. Emissions and costs vary by up to a factor of ten depending on the production region, with the most viable options concentrated in countries offering low-cost, low-carbon electricity or natural gas.	MAIN BC
	Tech Session 11B (SMC-102) TRACK: Production **Potential for Applying AI in Shipyard Processes** **Speakers: Alaysha Shearn & Mark Debbink** Moderator: TBD Artificial Intelligence (AI) is increasingly being integrated into defense industry processes and has proven to drive efficiency at lower costs. The Shipbuilding industry is in the process of assessing and implementing opportunities for AI integration to reduce costs, streamline processes, and provide competitive advantages. We're talking about saving money and creating additional value opportunities for organizations and the Navy. It starts with understanding where there is a problem. Then, it becomes, how can we solve it? In developing new processes, AI algorithms may be used to identify patterns and trends in large amounts of data, produce predictions, search and compile information, and generate designs that can inform the designer, builder, and operator for more efficient and effective ships. This presentation discusses both strategic and tactical utilization of AI capabilities through the execution several small projects demonstrating near-term AI value, identifying opportunities for wider use and implementation, and further defining future evaluation and implementation strategies. Our goal for these projects was to deliver results that can have	MAIN FGH

TIME	PROGRAM	Location
	common use across Navy programs with minimal impact on software/hardware configurations.	
	Tech Session 11C TBD	PDF Center