McNotes
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Current Projects

Bisso – ACMA recently completed a number of structural work projects that converted barge assets into pipe laying operations. Modifications for the "firing line", mooring and crane installations, and the stinger connection and A-frame supports were notable tasks included in the project scope. Bisso has additional work online similar to this and has requested that ACMA provide the kind of "stinger" design we've done for other clients in the past. As is the case with major modifications like this, stability had to be addressed as well as ABS class involvement.

Baysmart – We have recently been involved in the rework and vessel modification of a 120-foot crewboat into an excursion vessel with USCG Subchapter "T" endorsement. ACMA has provided structural design and analysis, system review and engineering, and complete stability review and analysis. We also brought Peak Electric, LLC onboard to engineer and provide oversight on the electrical installation. The vessel is expected to be inclined and placed into service in the last Quarter of 2014.

Baysmart's 120-foot crewboat currently under modification.

Institute of Nautical Archeology – Occasionally we luck upon a novel and fun job. This is one of them. ACMA has been asked to design a 70+ foot vessel that will provide a platform for oceanographic archeology services in Turkey.

Seadrill – ACMA provided new-build support on various piping systems for drillships that included the mud system, high pressure drilling fluid system and hydraulic system. The work also required structural analysis for the BOP handling system, as well as the riser handling equipment layout and structural checks for local revised structure. ACMA also verified the cabling and electrical system "as built" condition onboard the vessel.

OWTC LLC – ACMA is in the early stages on a new design for an offshore well testing vessel. ACMA finished its involvement on the conversion of a supply vessel to an OWT vessel and believes this market will become crucial as the quest for oil goes further offshore and the cost to develop these fields continues to escalate. According to Scott McClure, "We were the first to develop this type of service vessel to ABS rule requirements. This knowledge, as well as the lessons learned from our past job, allows ACMA to offer options that will economically expedite moving this kind of vessel to the marketplace and into operations."

Alan C.
McClure Associates, Inc.
Naval Architects • Engineers
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From the Top

After a very busy first half of the year dining on chicken, it would appear as though we have found our way back into the feathers. For those of you who have logged any time in the offshore industry, this is probably no revelation. But for those of you who haven't had this experience yet, it can be a little disconcerting. My advice is to "stay the course."

ACMA has done just that for almost 40 years by providing cost-effective, high quality service that embraces the basics, while welcoming the new technologies.

And, as is the case in any industry, downturns eventually turn up again, the feathers disappear and we begin filling our pots full of chicken. At ACMA, we think it starting to heat up in the kitchen again. At the very least, it's food for thought.

Scott C. McClure, President

New Crew

Two Naval Architects have recently joined the "crew" at ACMA.

Jason Bundoff

Jason Bundoff

Jason Bundoff, a recent graduate of the University of Michigan with a B.S.E. in Naval Architecture (2013) and an M.S.E. in Naval Architecture and Marine Engineering (2014), comes to ACMA with international experience gained through a 2011 Summer Internship at Hyundai Heavy Industries in South Korea.

An award-winning student at the University of Michigan, Jason gained basic experience in the design and fabrication of high-speed imager foundation and vibration mitigation systems and was responsible for setting up and conducting drag reduction experiments. At ACMA, he is initially concentrating on the application of AQWA and Star CCM+, hydrodynamic and computational fluid dynamics (CFD) software, respectively. He will also begin working on ACMA's stability analysis software GHS.

Nicholas Barczak

Nicholas Barczak

Washington State-Registered Professional Engineer Nicholas Barczak, a professional hydrodynamicist, has also come on board bringing his impressive design experience that includes structural, stability, hydrodynamic and seakeeping work for fishing vessels, research vessels, small craft and ferries.

Nick received his Master of Engineering in Naval Architecture and Small Craft Design in 2008 from the University of Southampton in the United Kingdom. He also attended Michigan Technological University where he studied Mechanical Engineering.

Prior to joining ACMA, Nick worked as a Naval Architect with Art Anderson Associates and Elliott Bay Design Group. He's well versed in ANSYS AQWA, AutoCAD, Rhino, GHS, C++, ANSYS CFX, StarCCM+, FreeShip and NavCAD as well as other resistance prediction programs. Nick's analysis skills include CFD techniques and CFD mesh deformation and chimera mesh, as well as wind tunnel and towing tank testing, hydrostatic calculations and stability calculations.

Check Out Our Corporate Website

Visit our corporate website at www.acma-inc.com for updates on all the services we offer, highlights of our leading-edge software and examples of a number of successful projects we've managed over the past four decades.

McNotes is published by
Alan C. McClure Associates

Founded in 1975, Alan C. McClure Associates, Inc. (ACMA) is one of the industry's premier naval architecture and engineering firms. Headquartered in Houston, Texas, we've provided advanced design and engineering services to our international clientele in offshore exploration, production and marine transportation for four decades.

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Thermodynamic Analysis

Retrofitting a Cryogenic Containment System into an Existing Hull Structure

ACMA recently finished a "high" level thermodynamic analysis using our Computational Fluid Dynamics (CFD) software that involves retrofitting an existing structural tank by the addition of a cryogenic liquefied natural gas containment vessel. The analysis involved the modeling of the localized structure that would ultimately provide the cryogenic tank support, as well as voids, double-bottom, wing tanks and cargo/machinery spaces that share common boundaries.

The boundary spaces were all modeled such that their native ambient temperatures were influenced by the cold nature of the sub-zero liquid. Insulation surrounding the cryogenic containment system was also modeled, as was the interface material between the tank support footing and what would ultimately become the hull supporting structure.

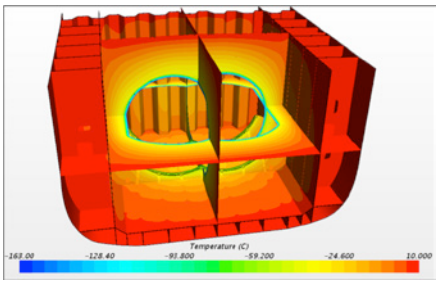
Early on, some of the boundary bulkheads were thought to be adversely affected by the cold air that was surrounding the cryogenic tank. When these boundaries had insulation modeled on them, there was a notable improvement on the temperature gradient that indicated less steel replacement would need to be done to facilitate the sub-zero cold environment.

It was initially assumed that boundaries may be less impacted by the cold air surroundings. In fact, they were adversely affected and were later modeled with greater depths and improved materials for insulation. Follow-up work will include volume air change circulation to remove the surrounding frigid tank air from the hull containment volume and meet class requirements, as well as fluid temperature variations from the surrounding boundary tanks.

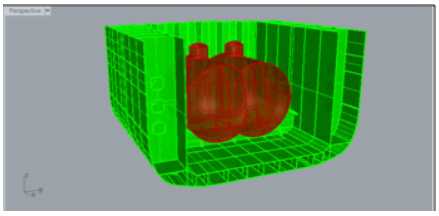
ACMA used Star CCM+ on this project because its flexibility allowed us to easily change performance parameters, such as ambient temperatures, insulation properties and material properties. We also used our in-house High Performance Cluster (HPC) to run the meshing components for the surface and volume of the model.

After the model was proofed for accuracy and adjusted for the array of problems that seem to come up when a model is meshing, the model then had all the properties associated and a "proof model" was run on the HPC. Once the meshed model (with all its math) ran for a brief period of time, the finished model was sent off to one of the "server farms" where it ran until it came to completion.

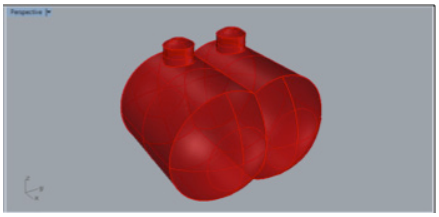
According to ACMA's Darrel Harvey, "The use of the server farm gives us the ability to use our in-house HPC on the smaller jobs, whether it's CFD or FEA, and cost-effectively obtain a finished product for the client. All in all, it's a win-win event."



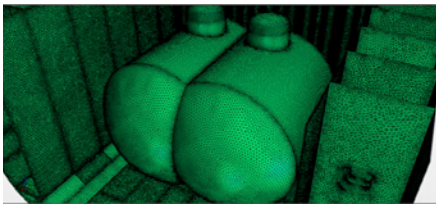
Temperature Plot of Steel Surface and Three



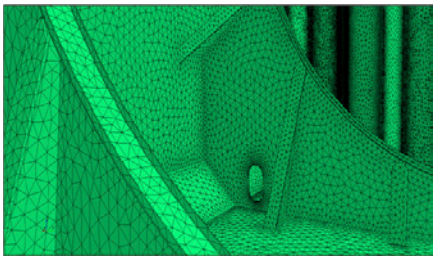
Steel Geometry with LNG Tank



LNG Tank Surface Geometry

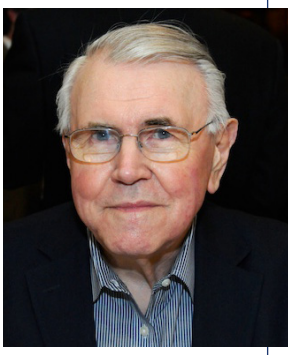


Surface Mesh of Steel and Insulation



Surface Mesh of Steel

Dietmar Deter: Determined to Become an Industry Leader



Dietmar Deter

Dietmar grew up in Germany and attended the Technical Universities of Munich and Berlin where he studied Mechanical Engineering, Marine Engineering and Naval Architecture.

I still recall my first landfall in the "New World," recalls Dietmar. "When the German general cargo vessel I was serving on as an assistant engineer arrived in the New York Upper Bay in August of 1953 and anchored off of Ellis Island, heavy fog had set in overnight, limiting visibility to just a few feet. Around 10 a.m., as I was standing on deck, suddenly the fog burned off and there was New York City - the Statue of Liberty, the Brooklyn Bridge and all the skyscrapers of Lower and Midtown Manhattan. It was a moment in time I'll never forget."

When his vessel finally tied up at the Continental Piers in Brooklyn, at the foot of the Brooklyn Bridge, Dietmar made his first trip ashore. There, in the window of a nautical supply store, he spotted a US maritime flag. He bought the flag, and it has accompanied him throughout his maritime journey and is now framed in his office at Alan C. McClure Associates, Inc.

Dietmar returned to the US in October 1968 and he settled in Houston. His first assignment was to negotiate a license agreement for his company in Hamburg with Sugar Land, Texas-based SEDCO Drilling Company that was manufacturing propulsion equipment.

Less than a year after his arrival, SEDCO prepared a proposal for Shell for the design, construction and operation of the world's first dynamically-positioned vessel. This new vessel would be built with large thrusters and power plants that would keep it in an exact position without anchors while exposed to wind, current and wave forces and allow it to drill oil wells in deeper water and heavier weather.

Dietmar was involved in the propulsion and stationkeeping aspects of the proposal. In January 1970, after fierce competition for the project among all leading offshore drilling contractors, the contract was awarded to SEDCO.

An intensive program for model testing of the vessel was scheduled to verify the speed and, most of all, the stationkeeping performance of the vessel under the specified environmental conditions. The results of some of those tests became landmarks in the evolution of propulsion engineering.

The sea trials and initial operation of the vessel confirmed that the design was a success, and the vessel became the world's first dynamically-positioned drilling base to drill for live oil wells. Upgraded a decade ago, the vessel is still in operation today with most of the originally installed propulsion systems in place.

In 1974, SEDCO was awarded the contract to design and build the first-ever dynamically-positioned (DP) drilling semisubmersible and the concept of propulsion that was developed for this project became the industry standard. Although many attempts at alternative solutions have been made, the concept is applied to every DP semisubmersible to this day.

All told, from 1969 through 1980, Dietmar was involved in the design, engineering and manufacturing of the propulsion systems for 39 offshore mobile drilling units.

When Alan McClure learned in 1986 that Dietmar had plans to start his own business, Alan offered him the opportunity to enter into an association agreement with ACMA. Dietmar accepted the offer and started his company, Nautex Inc., in office space that he sub-leased from ACMA.

Nautex Inc. became involved in several exciting projects, including the US Navy's Mobile Offshore Base (MOB), for which Nautex was contracted by the Navy to develop the propulsion and power systems for possibly the largest system ever—650,000 hp to power and provide propulsion for a mile-long floating air field.

In the following years, Nautex became involved in the engineering of the propulsion and stationkeeping systems for many DP drill ships and semisubmersibles for the industry's leading drilling and construction contracting companies.

In 1996, Dietmar and four colleagues co-founded the Dynamic Positioning Committee of the Marine Technology Society (MTS) with the goal of spreading knowledge about DP throughout the industry. The committee has organized an annual conference on DP technology which today is the world's leading event for this technology. The committee's database and website, including the papers presented during the conferences, are the most comprehensive source of

knowledge available on DP-related topics including power systems and propulsion.

Dietmar's work has taken him to more than 40 countries, from Iceland to the Philippines, from Norway to Chile, from South Korea to Mexico. One of his most exotic assignments was a stay in Yemen as an associate for ACMA.

Dietmar's accomplishments did not go unnoticed by his peers. In 2003, Dietmar was awarded the Distinguished Achievement Award by the Marine Technology Society. Additionally, he was elected Fellow by SNAME in 2007 and by MTS in 2008. In 2009, SNAME elected him to be the 16th recipient of the prestigious Blakely Smith Medal for Outstanding Accomplishments in Ocean Engineering. During the 2012 SNAME Offshore Symposium, he presented a paper on the AURORA BOREALIS project; the paper was selected as a Significant Paper of 2012 by the SNAME Featured Papers Committee and was published in the 2012 SNAME Transactions.

Besides his family, Dietmar has one love: his job. The satisfaction he receives from completing a challenging engineering job by applying state-of-the-art tools (and gadgets) keeps him going… and going. The only question that he ever dodges is, "When will you retire?"