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The SAWE Hampton Roads Chapter Participation in the 2nd Annual High School Boat Design Competition Sponsored by Northrop Grumman Apprentice School Student Chapter of the Society of Naval Architects and Marine Engineers

By Kelly Munn, NGSB-NN

The Society of Allied Weight Engineers' Academic Committee is becoming increasingly aware of local SAWE chapter involvement in student outreach initiatives, mostly in joint ventures with other professional engineering societies. Several members from different chapters for example are known to have supported college students in the AIAA sponsored Design-Build-Fly competitions. To assist in campaigning SAWE chapters to get involved locally or nationally in exposing youth to the excitement and reward of engineering, mass properties, and our professional society, the Academic Committee challenges all chapters to provide articles for publishing in the SAWE Weight Engineering Journal such as the one that follows to help inspire and ultimately secure future mass properties engineers.

William Boze, SAWE Academic Chair

Sink Oar Swim II
ATC — Virginia Beach, Virginia

Smooth Sailing
ATC — Virginia Beach, Virginia

Integrated Aluminum
Jamestown High, Williamsburg, Virginia

Integrated Aluminum earned the “Speed Freak” boat decal for being the fastest boat.

2009 High School Boat Design Competition

April 18, 2009, was a beautiful day to be standing on the Lion's Gate Bridge at the Mariners' Museum in Newport News, Virginia, watching the "Final Four" Apprentice School Society of Naval Architects and Marine Engineers (SNAME) sponsored high school designed boats race for the title. The crowd intently watched as the students worked the remote controls to steer their radio controlled boats around a race course specifically designed to test vessel speed and maneuverability. Only one student-designed and Apprentice-built steel boat could win the coveted traveling trophy. This year the honor went to the sleek mono-hull of the York High School Falcons team.

Over 200 students from the state of Virginia and Northeast South Carolina participated in this year's competition doubling the team entries from a year ago. The designs and calculations were evaluated in a collaborative
effort by Northrop Grumman Shipbuilding Naval Architects and Mass Properties Engineers, as well as Webb Institute scholars studying naval architecture. Only four finalists would be selected from the 23 teams to have their boats built by the Northrop Grumman Shipbuilding – Newport News Apprentice School. This year, the “Final Four” teams included: Sink Oar Swim II and Smooth Sailing from the Advanced Technology Center in Virginia Beach, Virginia; Integrated Aluminum from Jamestown High School in Williamsburg, Virginia; and the Falcons from York High School in Yorktown, Virginia.

The design parameters were even more demanding on the students this year challenging their knowledge of:

- Construction materials and drawings
- Payload, propulsion, and steering system Integration
- Weight, center of gravity, stability, draft, and trim
- Vessel speed and maneuvering performance

The boats were designed to carry one hundred pounds of sand and were limited in size by the two sheets of one-eighth inch thick steel (10 feet by 5 feet) provided for construction. For this year’s competition, boats ranged in weight from 450 to 600 pounds including payload and outfitting. The final designs were lofted and electronically converted to suit the shipyard’s new in-house laser cutting machine, and each vessel was assembled by shipyard apprentice students learning and perfecting their skills in vessel planning, manufacturing, and assembly.

With the increased number of design submittals to be judged, coupled with an increased number of finalist boats (from 2 to 4), the Hampton Roads Chapter of the Society of Allied Weight Engineers (SAWE) stepped up its involvement. Members of the SAWE reviewed the high school boat design weight calculation packages for accuracy as well as assisted again in the final weight and center of gravity validation. The accuracy of the high school students’ calculations was a critical component of the scoring brackets which decided which of the finalists boats would be declared the champion on competition day.

Events such as the Apprentice School Society of Naval Architects and Marine Engineers (SNAME) Boat Design Competition are needed now more than ever. Taking math and science skills from the classroom into real life applications is a great way to keep young minds challenged and focused. “The competition was designed to engage students’ math, science, and creative abilities and expose them to engineering, drafting, and project planning,” from Dr. Richard C. Boutwell, advisor to the Apprentice School’s SNAME chapter and boat competition founder. The Team captain from the winning York team agrees, “This really shows us what it takes to make a boat, math is the key.” Danny Hunley, Vice President of Operations at Northrop Grumman Shipbuilding – Newport News said, “Everyone comes out of this a winner – the students from The Apprentice School Society of Naval Architects and Marine Engineers, the high school student designers and the Northrop Grumman shipbuilders who stood beside the students to build their confidence and prepare them for their next challenges in life. We have forged bonds that will serve us well into the future.”


The 2009 SNAME Boat Competition winner —
Team Falcons,
York High School, Yorktown, Virginia