April 12, 2017 Meeting

The April 12, 2017 Waterloo Technical Society (WTS) meeting was called to order by President Gary Dorhout at 7:20 pm. President Dorhout noted that this was the seventh meeting of the 103rd year of the Society.

A total of 35 members and guests attended.

Treasurer's Report. Gary Dorhout reported on behalf of Ken Friend a balance of $934.17 with a $250 check to the Electric Boat Club at UNI. Our previous balance of $970.17, with no income during March from dues and expenses of $36 for the March speaker and guest leaving a balance of $934.17, and a check to UNI Solar Boat Club of $250 still outstanding. Treasurer Friend stated a total of 8 honorary and 55 paid members gave a membership roster of 63 members.

Old Business. The speakers for the remainder of the fiscal year have all been identified. Suggestions are still being accepted from the membership. President Dorhout presented this lineup:

Speakers for the 2016-2017 Meeting Year (Year 103)

- 14 Sep 2016 - Dr. Donald Gurnett from U of I. Voyager Spacecraft
- 12 Oct 2016 – Dr. Tim Nagel – Sign Technology
- 9 Nov 2016 – Mr. Steve Crouse – Facilities Changes at PEC
- 14 Dec 2016 – No Meeting
- 11 Jan 2017 - Brian Keierleber – County Engineer, Independence – Ultra High Performance Concrete used in Bridge Building
- 08 Feb 2017 – FIRST (For Inspiration and Recognition of Science and Technology) Robotics – Team Presentation
- 08 Mar 2017 -- Mr. Erick Mandt– Vice-President of Sales and Marketing at Fluidyne Corporation in Cedar Falls -- “ISAM™” (Integrated Surge Anoxic Mix), an innovative wastewater treatment process for municipalities and industries.
- 12 Apr 2017 – UNI Solar Boat Team
- 10 May 2017 – Jeremiah Treloar -- Virtual Painter Training System

Speakers for the 2017-2018 Meeting Year (Year 104)

- 13 Sep 2017 – Cody Wilkinson – John Deere Small Grains, Air Seeding Equipment
- 11 Oct 2017 – Mr. Gomes – Using Ultra-lights for Crop Inspections
- 8 Nov 2017 – Robert Levis -- WCF&N Railroad by Gene Van Gorder, 319-233-4235
- 13 Dec 2017 – No meeting
- 10 Jan 2018 --Willie Calderwood, Cedar Valley Corp - Road Construction Techniques and Equipment
- 14 Feb 2018 -- Tom Parsons – Current Concrete Road Paving
- 14 Mar 2018 -- Bill Close – Mega Sculptures
- 11 Apr 2018 -- Eric Thorson, P.E. City of Waterloo -- Water Tower System
- 9 May 2018 -- Available

Officers for 2016-2017

President:	Gary Dorhout
Co-Vice Presidents:	Jerry Mohling and James Stevenson
Treasurer:	Kenneth Friend & Paul Anderson

Dinner Reservations:	Derek Eagles & Steve Lang
Secretary:	James Stevenson
Publicity/Recognition:	Todd Whiting
Auditing:	Bill Mitchell & Jim Garrett
Nominating Committee:	Open
Web Site:	Tim Schoenfelder

New Business. No new business was discussed.

Guest Speakers: Three members of the UNI Solar Boat Club and their sponsor presented information on the status of the boat that will compete in Dayton, OH, in June 2017.



Figure 1. UNI Solar Boat that will compete in June 2017.

Solar Boat Club students from the Department of Technology at UNI are working on upgrading the motors and battery system of the UNI Solar Boat for competition in June 2017. They talked about the boat, Figure 1, its operation in detail, provided information about the competition plus shared their experiences working on the boat.

The Solar Boat Club was established at UNI in 2000. This student organization has the mission of acquainting UNI students with the present and future scope of renewable energy, promoting interest in science, technology, and education, and providing students an opportunity to apply energy efficiency and conservation theory to a practical project in a team environment. The team will join the Solar Splash at the World Championship of intercollegiate Solar/Electric boating in Dayton, Ohio in June 2017.



Figure 2. Speaking for the UNI Solar Boat Club (Left to Right): Ian Alexia, Electrical and Electronic Engineering Technology, Christopher Boland, Manufacturing Technology, and Aaron Houtz, Electrical and Electronic Engineering Technoloby.



Figure 3. Solar Boat with student speakers Ian Alexia, Christopher Boland, UNI Technologist Russell Roth, Dr. Sadvik Kucuksari, sponsor, and Aaron Houtz in Clarion Inn parking lot.

The Solar Boat is a multi-disciplinary project requiring hands-on experiential learning. The competition includes sprint (fastest mile time), slalom (fastest time around buoys to challenge steering control), endurance (operating for an extended period) and workmanship (integration of form and function). Fifteen universities compete from around the globe. Place recognitions of First, Second and Third are awarded in each event as well as an overall performance category.

Boats are judged on their use of renewable energy, optimum power output, mechanical drive design, and effective power usage for speed and endurance. The hull was fabricated in 2007, has been modified in

subsequent years and now needs restoration and strengthening. Aircraft foam and aluminum struts make up the hull. The lightest weighing member is selected as boat skipper who sits in the middle of the boat to help keep the bow in the water when the boat is speeding underway. The skipper must pass a swimming safety test. Thought and research as well as special fabrication are required on the rudder, propeller, motors and pulley controls. The boat is powered by three 15 horse power electrical motors costing $1,500, six 600 Watt solar panels which recharge three 12 volt, 13 Amp-hour batteries.

Two propellers are used. A four-blade propeller is used for the endurance competition while a two-blade is used for the sprint. Propellers are geared to the motors through belt drives to enable a 2,500 to 3.000 rpm rotation. The boat can reach speeds of 47 mph. Endurance is based on time of operation until stalling due to insufficient power.

Motors have worn down where the brushes ride. To reduce heating, the team developed silver-copper brushes to replace the original copper. Motors need to be replaced due to the wear.

The absence of an advisor two years ago led to no Solar Boat Club members. Documentation left by previous members who have graduated was a great help to help current members understand rationale and effort needed to prevail in the competition. The experience with this competition is valued by local employers. Interest and support in the Club is high for students and employers. Donations are always welcome.

Donation. Waterloo Technical Society President, Gary Dorhout, presented UNI Solar Boat Club Sponsor, Dr. Sadvik Kucuksari, with a check for $250. Dr. Kucuksari thanked WTS for its interest and support

Next Meeting. Our May 10, 2017 meeting features Jeremiah Treloar speaking about UNI's Virtual Painter Training System.

Meeting adjourned at 8:00 pm.

Respectfully submitted,

James R. Stevenson, Vice President and Secretary