November 9, 2016 Meeting

The November, 2016 Waterloo Technical Society (WTS) meeting was called to order by President Gary Dorhout at 7:15 pm. President Dorhout asked members to find guest speakers for 2017.

A total of 43 were in attendance.

Treasurer's Report. Ken Friend reported the treasury had a beginning balance of $1,100.17 with $90 income from dues and expenses of October's speaker's dinner of $18 and refunds of $20 of double payment of dues leaving a balance of $1,152.17. A total of 8 honorary and 41 paid members gave a membership roster of 49 members.

Following a brief Audit report from Bill Mitchell and Jim Garrett, the members recognized Ken Friend's effort to keep membership and treasury amounts accurate. Ken's work is admired by the members and we thank him for his continue support.

Old Business. The speakers for the remainder of the fiscal year have not 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 – High Performance concrete used in Bridge Building
08 Feb 2017 – FIRST Robotics – Team Presentation
08 Mar 2017 -- Mr. Gomes – Waverly-using Ultralight for crop inspections-Tim
12 Apr 2017 – UNI Solar Boat Team
10 May 2017 – Open

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

New Business. No new business was discussed.

Guest Speaker: Steve Crouse presented Facilities Changes at PEC. Mr. Crouse is currently a Facility Engineer at the John Deere Product Engineering Center in Waterloo. He has worked at John Deere in Dubuque, Brazil and Waterloo over the past 43 years. He speaks Portugese as well as English. Work assignments include:

- Design Engineer: Loaders, Dozers, Excavators, Tractor axles, Factory and Experimental Shop Supervision
- Application Engineer for Deere OEM customers

John Deere Product Engineering Center (PEC). PEC is a 600 acre facility purchase in 1950 for the design and testing of tractors. In 1982 the current facility was completed. Originally, PEC housed 450 engineers in the three-story building. Now 1500 employees, not all engineers, are housed in the 11 acres of buildings on 795 acres of grounds. The test facility has over 100 dynamometers for engine and transmission testing. One tanker of diesel fuel is used each day. The facilities have capability of conducting tests for engines, transmissions, axles and electronics. In addition an environmental test for temperatures to minus 40 Fahrenheit and sound are available.

Test tracks. In 2010 facility upgrades were approved. Electrical power, building cooling, and larger assembly bays were to be included. In addition, a paved test track to evaluate designs before Nebraska tests are done to qualify vehicles for sale in North America.

By 2013 the Facilities Team had identified 21 projects. In May 2014 funding for these was approved. One of these projects was a shift development hill. The hill has a 15 degree upward slope heading West and 10 degree decline facing East. There is a 38 foot drop on a 25 foot wide lane. Eighty trucks of concrete were required to create this track. The track also enables test of tractor brakes to meet an anti-lock brake standard required by the European Union in 2018. Each wheel can be tested independently. Ice is simulated with smooth concrete.

ISO 5008 rumble track was created to evaluate steering control. The track is two feet thick with no expansion joints and a defined surface profile above the base to comply with the standard. Each lane has different elevation profiles, each eight feet wide with a two foot separation between lanes.

Additional projects. Hoop Building to keep test personnel out of the weather. This is similar to a Quonset hut with a canvas top for shelter.

Building and electrical. A new 13,800 volt sub-station was created. Previous 4,160 volt transformers were converted to 13,800 volt transformers.

Boost pump. For fire-fighting a new booster pump to supply 2,000 gallons per minute was installed.

Water supply upgrades. A twelve inch diameter main line was built from Ridgeway Avenue to a cooling tower to evaporate dyno heat.

Wind tunnel. A new wind tunnel that uses a 100,000 cubic feet per minute fan was designed and installed. This permits controlling the air temperature to +/- one degree Fahrenheit.

New assembly floor. Bays for assembly of new vehicles are large enough to accommodate current and expected future vehicles by being sized to 30 feet wide by 60 feet deep. Height was expanded to accommodate larger cranes. The hook height is 20 feet from the floor. Scales and hoists are provided to each bay. The building is 62,000 square feet with 18 feet high by 26 feet wide entry doors. Floors are twelve inches thick to accommodate vehicle weights.

Next Meeting. Our January 11, 2017 meeting features Mr. Brian Keierleber addressing High Performance Concrete Used in Bridge Building.

Meeting adjourned at 8:45 pm.

Respectfully submitted,

James R. Stevenson, Vice President and Secretary