March 9, 2016 Meeting

The March 9, 2016 Waterloo Technical Society (WTS) meeting was called to order by President Gary Dorhout at 7:25 pm.

A total of 41 were in attendance.

Treasurer's Reports. Treasurer Ken Friend reported a beginning balance of $1,538.08 with income from 1 membership dues of $10 and expenses of February's speakers dinner of $54 leaving a balance of $1,494.09. Still outstanding is the purchase of the public address system for $377.92 and a pledge to the Solar Boat Racing Team of $300 leaving $816.17 available for use by the Society. A total of 11 honorary and 59 paid members gave a membership roster of 70 members.

Old Business. President Dorhout requested that members invite speakers for the 2016-2017 year. Potential topics have been suggested:

1. Explanation of where recycling goods go and how they are processed. Common problems with material.
2. Current concrete road paving techniques, problems from the road engineers view point. Steve Crouse suggested Joe Owen of Kerry Cunningham Construction might speak on this topic.
3. Crop spraying by airplane problems, effectiveness, what crop problems are handled that way.
4. History of original land surveying.
5. History of manufacturing in Waterloo and Cedar Falls.
6. History of railroads in Waterloo and Cedar Falls, especially the WCF&N electric line.
7. History of mining in Iowa: Coal, Galena, Lead, Fracking sand.
8. Aerial photo services .

If anyone knows someone who could speak to those topics please let President Dorhout know.

Nominations for next year's officers are now being solicited. If any member has interest in an office, notify President Dorhout.

New Business. Bob Dietrich announced that the First Robotics Challenge would be held at the UNI Dome on March 24 and 25. The floor of the UNI Dome would be the competition arena with equipment preparation in the McLeod Center. All members are urged to attend this event.

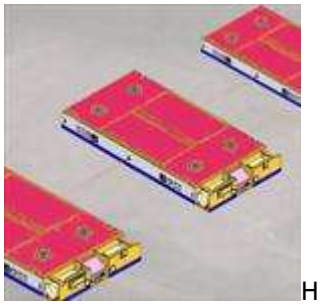
Guest Speaker. Mr. Craig Schmeiser, Wheelift Program Manager for the Doerfer Companies, explained the technology behind Wheelift Transporters and how they are being used to transport NASA's new Space Launch Systems (SLS )rocket as part of the quest to send man to Mars.

Speaker: Craig Schmeiser is a registered Professional Engineer living in Cedar Falls. In the years since receiving his BSME degree from the University of Iowa in 1973, Craig has designed cranes for Link Belt, excavators for John Deere and for the past thirty years has worked for the Doerfer Companies' Iowa location. The past ten years have focused on the development of Doerfer's Wheelift heavy load transporters.

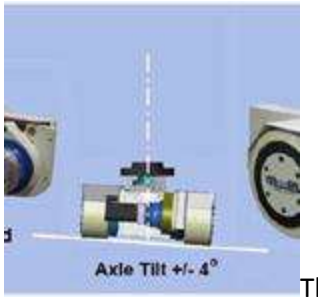
Doerfer Background: A history of Doerfer Companies can be seen at http://www.doerfer.com/corporate/History.htm . The company's origin can be traced to 1854 when New England entrepreneurs Alfred and Parley Williams, Charles Heald and Marvel White opened Williams, Heald & Company and Molline Iron Works in Moline, IL. In 1880 Williams and White (Heald had retired in 1867 and his name was dropped from the corporate name) invented the "Bull-Dozer", a machine with nearly universal manufacturing applications. In 1961 Dick Doerfer opened Doerfer Engineering in Cedar Falls. Early projects included agricultural equipment design. That same year Fred D. Wright Company moved to current Nashville location on Spence Lane. Dick Doerfer sold his company to Container Corporation of America in 1973. In 1984 Mobil Oil acquired Container Corporation of America and Doerfer Engineering. Through many acquisitions such as Advanced Automation for its robotics technology Doerfer Companies held a diverse manufacturing, tool and die, robotic and engineering capability with headquarters in Waverly, IA. With Doerfer Engineering in 1995, the company began acquiring more capabilities. In 1999 Doerfer acquired H&H Machine Tool, merging its assests with those of Doerfer Engineering. GMT with three divisions: Tool-Die-Systems (TDS), production machining division and production fabrication division which Doerfer acquired in 2003 and renamed the company TDS Automation. In 2004 Doerfer consolidated assets of Doerfer Engineering and TDS Automation and closed the Doerfer Engineering office in Cedar Falls, IA. In 2006 Doerfer acquired the license to Wheelift technology and began to develop and market the Wheelift mobile / material handling applications as part of its mobile automation segment.

Wheelift Transporters. Initially Doerfer had provided transportation pallets using air bearings. These required flat concrete surfaces and had rubber skirts to maintain air pressure to move heavy loads. Noise and greater load requirements soon lead to the realization that wheels needed to be added, but with independently powered axles. Transporters were of two varieties: headed and headless.


Headed Wheelift pallet.


Headless Wheelift pallets.

Each pallet has power of its own. Electrically powered have a 480 volt, 3 phase motor with cable providing power. Also available are gasoline powered and natural gas powered pallets. . Single acting hydraulic cylinders are part of each wheel assembly which has its own power unit






The movement of the pallets are controlled by a human operator using a joystick control box. A LCD screen gives the operator a picture of the status of the Wheelift pallet at all times.



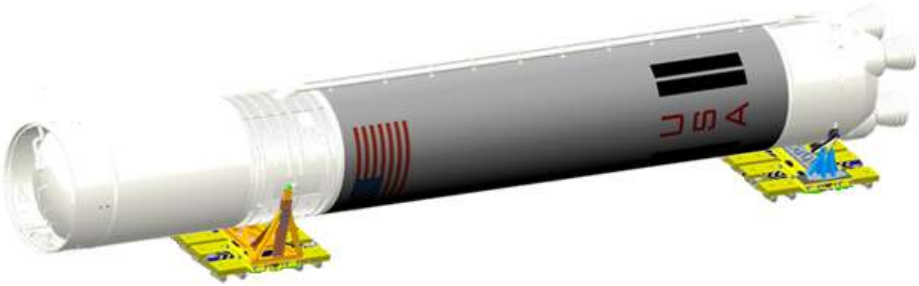
Wheelift pallet showing the LCD display and the control box beside the screen.

The operator controls speed, vertical elevation and direction. The fully-loaded pallet can move at a speed of 110 ft/min which is the speed of a moving walkway at an airport. All pallets are load tested using either concrete block weights of slabs of steel from O'Neal Steel in Waterloo.



Pallet loaded with steel to test lift capability.

Multimode. For large loads the pallets can be ganged together of used at load extremities to support movement. Communication between the pallets is





maintained through laser measurement and computer interpretation with feedback to each of the wheel units.

Uses. Wheelift pallet transporters are currently employed in:

- Nuclear plants
- Transformer plants (ASEA Brown Boveri (ABB) in Tennessee)
- Turbine shaft for submarines using multimode transporters and precision placers
- Navy shipyards
- Anti-neutrino detector movement (5m dia by 5m tall vat)
- Space Launch Systems (SLS) for assembly and movement to launch site.

More information on Wheelift transporters may be found at their website, http://www.wheelift.com/.

Tour. The meeting adjourned at 8:15 to reconvene at 1875 Big Rock Road, Waterloo, IA facility tour. Here the design, control, component structure, movement and testing of lift capability were demonstrated.

Next Meeting. Our April 13, 2016 meeting features Mr. Steven Bernard of Cedar Falls Utility, explaining the technology behind the Solar Power Park.

Respectfully submitted,

James R. Stevenson, Vice President and Secretary